AVIATION WEEK

MARCH 14, 1949

A McGRAW-HILL PUBLICATION

L-M—Bartows on Salt Lake City's 6,830' N/S instrument runway, seen from the control tower. These are the latest controllable type providing 180,000 glare-free beam candlepower.

Now-Salt Lake City brings 'em in safely with

L-M–BARTOW

high intensity controllable beam runway lights

More Airports use "L-M—Bartow" than all other high intensity runway lighting systems combined

Boston • Chattanooga • Chicago
Indianapolis • Knoxville • Milwaukee
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(International) • New York (LaGuardia)
Philadelphia International • Phoenix
Raleigh-Durham • St. Louis • Salt Lake City
Topeka • Worcester • Amsterdam
Brussels • Canton • Dublin
Hankow • Panama City
Paris (Orly) • Shanghai • Shannon

L-M—Bartow High Intensity lighting is today installed at, and being ordered by, more airports than all other high intensity runway lighting systems combined. L-M—Bartow's exclusive controllable beam makes it possible to use the very high intensity of 180,000 beam candlepower, without glare to the pilot. No wonder it cuts delays, stacking, and cancellations, and increases safety on take-off and landings. No wonder you find it at so many important airports, such as Salt Lake City. For details on lighting for large or small airports, phone or write **Line Material Co., Airport Lighting Division, East Stroudsburg, Pa.**

LM

LINE MATERIAL Airport

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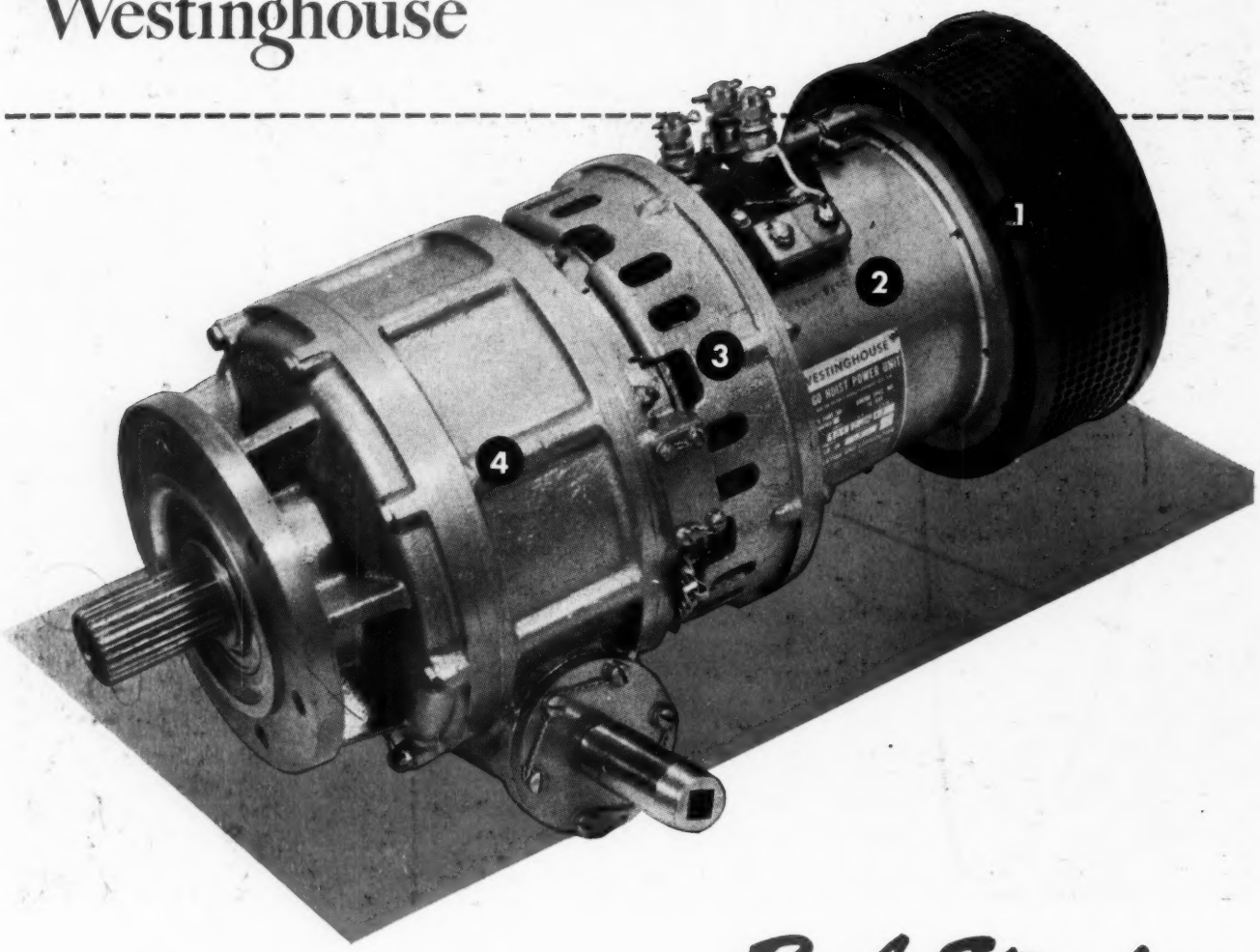
YOU CAN BE **SURE**.. IF IT'S

Westinghouse



Airborne weight lifter with *Real Stamina*

A leading aircraft manufacturer sought a better cargo hoist unit to expedite the loading and unloading of planes to be used in a vital cargo carrying operation. Specifications called for explosion proofing, greater dependability and longer life than existing units.

Westinghouse was selected to do the job.

The finished product, which more than meets these stiff requirements, is illustrated above. Here are some of its advanced features.

1. **Newly developed flame arrester that makes the assembly explosion-proof.**
2. **Twenty-four volt, specially-designed, d-c motor.**
3. **Speed limiter for close regulation of up and down speed.**
4. **Triple planetary gears for speed reduction.**

In addition, the unit contains a torque-limiting clutch and a magnetic brake for holding the load in case of power failure. Also separate construction of brake and speed-limiting device permits accurate "inching" of the hoist for handling critical loads.

Weighing only 92 lbs., it is capable of lifting 4,300 lbs. at the rate of 24 feet per minute. Its unusually long life eliminates the necessity of carrying a spare so that both weight and space are saved.

A Westinghouse Engineer will be glad to give you further information or work with you on other aircraft problems.

J-21517

Westinghouse

LEADER IN AVIATION EQUIPMENT

"Engine fire will start in 10 seconds"

Engine fires are no accidental occurrence at the Kidde proving grounds! They're planned in advance, started by the hundred, in a B-26 power plant—fanned instantly into a roaring blaze by the artificial slipstream set up by the propeller of a second engine.

That's how we go about studying the speed and efficiency of fire-extinguishing agents—under conditions that closely approximate actual flight. CO_2, MB, CB, DL, the Freons—we've timed the fire-killing speed of them all with split-second accuracy.

That's just a part of Kidde's research program—continuously carried on in the interests of safer flying. We're always ready to place the results of our research at the disposal of government agencies, aircraft manufacturers and transport companies.

The word "Kidde" and the Kidde seal are trade-marks of Walter Kidde & Company, Inc.

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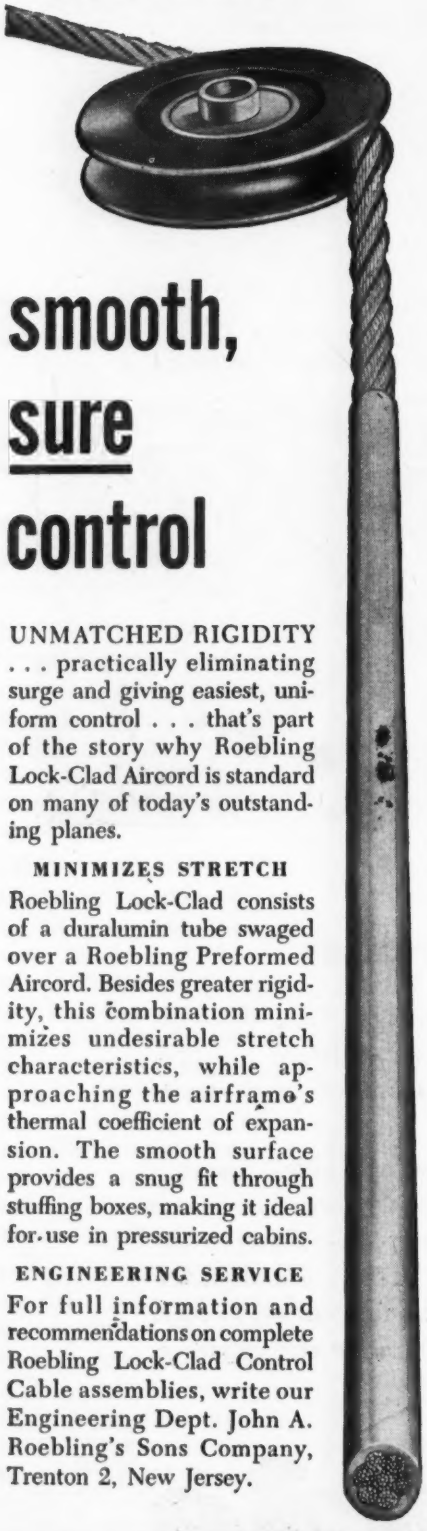
Walter Kidde & Company, Inc. • **318 Main Street, Belleville 9, N. J.**

ROEBLING
LOCK-CLAD



smooth, sure control

UNMATCHED RIGIDITY . . . practically eliminating surge and giving easiest, uniform control . . . that's part of the story why Roebling Lock-Clad Aircord is standard on many of today's outstanding planes.

MINIMIZES STRETCH

Roebling Lock-Clad consists of a duralumin tube swaged over a Roebling Preformed Aircord. Besides greater rigidity, this combination minimizes undesirable stretch characteristics, while approaching the airframe's thermal coefficient of expansion. The smooth surface provides a snug fit through stuffing boxes, making it ideal for use in pressurized cabins.

ENGINEERING SERVICE

For full information and recommendations on complete Roebling Lock-Clad Control Cable assemblies, write our Engineering Dept. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

A CENTURY OF CONFIDENCE

Vol. 50, No. 11

AVIATION WEEK

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Boeing Stratocruisers will accommodate up to 80 passengers.

New Mistress of the Clipper Fleet

With the delivery of the first of a fleet of 20 Boeing Stratocruisers to Pan American World Airways, the history of commercial aviation will open a fresh chapter.

For the Stratocruiser is not just a "bigger and better" edition of present-day airliners. It is a completely new kind of airplane, embodying scores of advances in basic design and engineering.

Many of these new principles have brilliantly proved their worth in the great Boeing Superfortresses — the B-29 and B-50. Others, specifically developed for transport service, have helped give the Air Force's C-97 Stratofreighters their outstanding performance.

These design innovations produce some extraordinary results. The twin-deck Stratocruiser is faster (340 mph. cruising speed) — roomier (with ample space for up to 80 passengers) — far more comfortable — yet *more* efficient in operation than any other transport now in service.

Now coming off the production lines in steadily increasing numbers, more and more Stratocruisers will be delivered to six major airlines in the next few months. Built into every one is the airworthy staunchness traditional in Boeing airplanes.

Here's why these airlines chose Boeing Stratocruisers as their new fleet queens:

1. *Outstanding passenger appeal — spaciousness and comfort.*
2. *Superior flight characteristics and dependable performance.*
3. *Increased safety through proved structural integrity and equipment research.*
4. *Greater speed and payload, easier maintenance, resulting in low operating cost.*

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SCANDINAVIAN AIRLINES SYSTEM

NORTHWEST AIRLINES

AMERICAN OVERSEAS AIRLINES

UNITED AIR LINES

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STRATOCRUISER

A good place to land

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FLIERS prefer to use airports where they're made to feel welcome . . . where service is prompt and reliable . . . where lubricants and fuels are a trusted brand. Airports where Texaco Aviation Products are sold are like that.

Texaco Aircraft Engine Oil is a favorite with fliers everywhere. It keeps rings free . . . maintains full power . . . assures fuel economy . . . permits extension of overhaul periods . . . assures real protection against wear . . . materially reduces maintenance costs. Best proof of its quality is the fact that —

More revenue airline miles in the U. S. are flown with Texaco Aircraft Engine Oil than with any other brand.

Texaco aviation lubricants and fuels are available at well equipped, well run airports — good places to land. The Texas Company, *Aviation Division,* 135 East 42nd Street, New York 17, N. Y.

TEXACO Lubricants and Fuels
FOR THE AVIATION INDUSTRY

Tune in . . . TEXACO STAR THEATRE presents MILTON BERLE every Wednesday night. METROPOLITAN OPERA broadcasts every Saturday afternoon.

NEWS SIDELIGHTS

Tax Cut

Chances for having the 15 percent transportation tax slashed to its prewar level of 5 percent appear excellent.

House Republicans have unanimously endorsed this, and there is substantial support for it among Southern Democrats. A sprinkling of administration Democrats also favor the move, including Rep. John Kennedy (D., Mass.) who has introduced a bill to repeal the wartime-imposed levy.

Route Plan

Although theoretically ideal, the Hoover Commission's proposal that the Secretary of Commerce map out an overall transportation route system is not given much weight as a practical proposition: the route structure, which largely "just grew", is already set.

Any basic change is obviously out of the question. The Secretary's plan could only influence comparatively minor route additions and changes.

Under the Hoover Commission plan, the Secretary would present his case before the Civil Aeronautics Board, Interstate Commerce Commission, and the Maritime Commission, opposing or favoring route developments according to whether or not they conform to his overall plan. The Secretary would also be empowered to initiate actions before the regulatory agencies.

Stiff Competition

Bankruptcy proceedings involving Peruvian International Airways have pointed up the financial difficulties of other Latin American flag lines attempting to buck increasingly severe U.S. competition.

Officials of the foreign carriers are finding their governments have become reluctant to pour more money into "prestige" routes. They talk sourly of the "huge subsidies" provided by the U.S. for Pan American Airways, Braniff, Panagra, Chicago & Southern and National.

The government-owned Venezuelan carrier Linea Aeropostal Venezolana (LAV), which operates Constellations from Caracas to Havana and New York, recently announced a thorough departmental reorganization in an attempt to reduce heavy losses.

Nonsubsidized Peruvian International Airways in February said the Peruvian government would extend financial aid, but the support was not forthcoming by early this month, when the carrier closed its New York offices after suspending service. U.S., Canadian and Peruvian stockholders have nearly equal interests in PIA.

Hoover On Air

Hoover Commission's recommendation that National Advisory Committee for Aeronautics be placed in the Commerce Department is not expected to get far.

The military, as well as NACA itself and private aviation circles, are expected to oppose it. Under the Hoover Commission plan, Commerce Department would be composed of two divisions—a transportation service and an industrial and commercial service.

All non-regulatory government transportation activities would be lumped into the transportation service, including all of the activities of the Civil Aeronautics Administration, safety enforcement functions of the Civil Aeronautics Board, and the NACA.

Dissenting from the Commission's recommendation, member James Pollock, president of the University of Michigan, commented: NACA "has had many years of successful operation as an independent agency. . . . (Its) organization problems . . . have not been sufficiently explored . . . to justify any definite recommendation as to its location in the structure of government. At least ten executive agencies are concerned with the research conducted . . ."

10,000 Miles

U.S. Air Force does not plan to send its B-36 bomber on a round-the-world mission using aerial refueling.

The B-36B could do about 16,000 miles nonstop using bomb bay tanks and without refueling. However, significant military range of the intercontinental bomber is 10,000 miles and USAF is not interested in any greater ranges. B-36 can do its military job without refueling.

Main point of the B-50 refueling operation, missed by many newspaper columnists, was to prove the efficiency of pre-determined refueling schedules, world wide communications network and incidentally Strategic Air Command's security system. B-50 can do its military job over a 10,000 mile range with only one refueling.

Airlift Scoreboard

Berlin airlift passed the million ton mark last month with a total of 1,034,349 tons delivered by U.S. and British planes during the first eight months of operations.

British planes have delivered 253,386 tons with the balance of 780,963 tons carried by USAF and Navy planes.

Record daily tonnages were delivered on Feb. 22 and 23 with 7515 and 7898 tons respectively. Total U.S. airlift costs have now risen to $119,702,600 including a termination reserve. Total of 20 aircraft including 14 C-54s and 6 C-47s have been lost.

PRO Shifts

U.S. Air Force Public Relations Director Steve Leo has reshuffled his top level assistants in what amounts to a three-way switch.

It brings Brig. Gen. A. Robert Ginsburgh into the military deputy job vacated by the retirement of Brig. Gen. George Schulgen; takes Col. Bill Nuckols from his job as director of air information to become special assistant to Leo; and moves Col. Sory Smith from executive to Gen. Vandenburg to Nuckols's former post as director of air information.

More Transports

U.S. Air Force fiscal 1950 procurement program has a big stable of transports but none of them will meet the requirements set by Berlin airlift director, Maj. Gen. William Tunner for an efficient military cargo plane.

USAF will buy Chase C-122s for light assault transports; Fairchild C-119Bs for medium troop carrier squadrons and Douglas C-124As to be utilized in heavy troop carrier squadron operations.

Also in the fiscal 1950 picture are more military versions of Lockheed's Constellation. Convair is also scheduled to sell USAF more Convair-Liners as the T-29 advanced twin-engine trainer.

*** ZERO BACKLASH**
and
SIMPLICITY
of the
Trim Trol
TRIM TAB ACTUATOR

. . . resulted in its adoption in the flight control systems of the following advanced aircraft:

	GRUMMAN	JR2F-1 SA-16	"ALBATROSS"
	McDONNELL	F2H-1 F2H-2	"BANSHEE"
	CHASE	YC-122 YC-123	"AVITRUC"
(RESTRICTED)	CHANCE VOUGHT		
(RESTRICTED)	REPUBLIC		

Improvements in '49 models have been incorporated as a result of continuous development:

* ZERO BACKLASH at the output shaft thru Balanced Torque drive • Radio Noise Filter built in to meet the noise level requirements of Specification AN-M-10a • Reduced weight • Increased Performance • Increased Brush Life • Infinitely adjustable limit switches and position transmitter accessible AFTER INSTALLATION • "Positioning" and synchronizing controls available without modification of envelope • Two basic models to suit space requirements.

WRITE TODAY FOR LITERATURE
ON THESE NEW '49 MODELS

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Western Representative
JAMES L. ADAMS & CO. • LOS ANGELES 6.

AVIATION CALENDAR

Mar. 14-16—Symposium on engineering research, Center for Continuation Study, University of Minnesota, Minneapolis.

Mar. 17—SAE metropolitan section, fuels and lubricants, Hotel Statler, New York.

Mar. 18—Annual national aircraft propulsion meeting, Hotel Carter, Cleveland, sponsored by IAS.

Mar. 22—ICAO African-Indian ocean air navigation meeting, Algiers.

Mar. 22-24—Air Transport Assn., annual airline engineering and maintenance conference Continental Hotel, Kansas City.

Apr. 11-13—Society of Automotive Engineers national aeronautic and air transport meeting, Hotel New Yorker, New York.

Apr. 11-14—SAE national aeronautic and air transport meeting, Hotel New Yorker, New York.

Apr. 11-16—Western Metal Congress and Exposition, sponsored by American Society for Metals, Shrine Civic Auditorium, Los Angeles, Calif.

Apr. 19-20—Fifth annual meeting of the Magnesium Assn., Edgewater Beach Hotel, Chicago.

Apr. 19-21—AIEE southwest district meeting, Baker Hotel, Dallas, Tex.

Apr. 24-27—American Assn. of Airport Executives convention, Oklahoma City.

Apr. 29-30—Sixth IAS personal aircraft meeting, Hotel Allis, Wichita.

May 2-4—2nd annual meeting of the Airport Operators Council, Denver.

May 5-6—Purdue University School of Aeronautics air transportation conference, Lafayette, Ind.

May 18—National Fire Protection Assn. committee on aviation and airport fire protection, Fairmont Hotel, San Francisco.

May 19-21—Society for Experimental Stress Analysis, spring meeting, Hotel Statler, Detroit, Mich.

May 23-24—Annual meeting of the Magnesium Assn., Edgewater Beach Hotel, Chicago.

May 23-26—Eighth national conference, Society of Aeronautical Weight Engineers, Inc., Biltmore Hotel, Dayton.

May 24-27—Second joint conference of IAS, Royal Aeronautical Society, Hotel Astor, New York City.

June 3-12—Sixth annual Michigan Aviation week.

June 4-5—Fourth annual air fair and industrial exposition, Shawnee, Okla.

June 20-24—AIEE, summer general meeting, New Ocean House, Swampscott, Mass.

PICTURE CREDITS

12, 13, 23—Convair; 14, 15 (right)—Wide World; 16—USAF; 26—Boeing; 27—Martin, NACA; 36—Aeronca.

Choose the Leader . . . *For VALUE!*

CHEVROLET ADVANCE-DESIGN TRUCKS

CHEVROLET From one end of the nation to the other, more truck users buy Chevrolet trucks than any other make. Chevrolet trucks offer more of what truck users want—more power combined with economy . . . more comfort and convenience . . . greater ease of handling . . . more value from start to finish! And to all these advantages you can add the biggest premium of all—3-WAY THRIFT! Here's the one truck that combines low cost operation, low cost upkeep and the *lowest list prices in the entire truck field!*

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Chevrolet Trucks alone have all these features

Chevrolet's 4-SPEED SYNCHRO-MESH TRANSMISSION offers quicker, quieter and easier operation in Series 3800 and heavier duty trucks. Faster shifting maintains speed and momentum on grades.

Chevrolet trucks have the famous CAB THAT "BREATHES"*! Outside air is drawn in and used air forced out! Heated in cold weather.

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Chevrolet Advance-Design brings you the FLEXI-MOUNTED CAB, cushioned on rubber against road shocks, torsion and vibration.

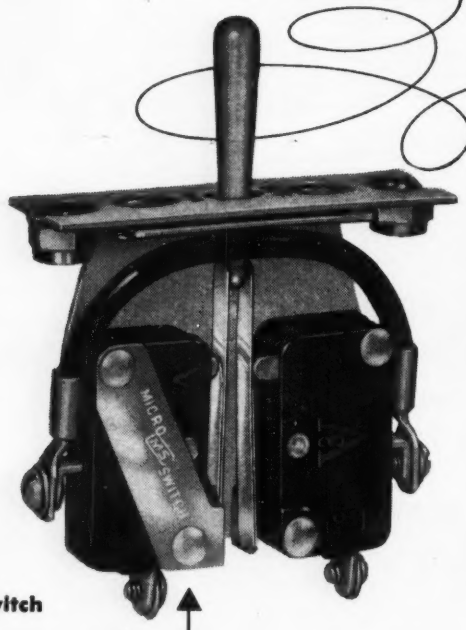
Chevrolet's exclusive SPLINED REAR AXLE HUB CONNECTION adds greater strength and durability to heavy-duty models.

Uniweld, All-Steel Cab Construction • Large, Durable, Fully-Adjustable Seat • All-Round Visibility with Rear-Corner Windows* • Heavier Springs • Super-Strength Frames • Full-Floating Hypoid Rear Axles in the 3600 Series and Heavier Duty Models • Specially Designed Brakes • Hydrovac Power Brakes in Series 5000 and 6000 Models • Standard Cab-To-Axle Length Dimensions • Multiple Color Options.

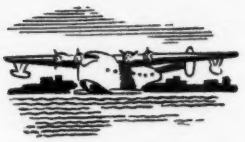
**Heating and ventilating system and rear-corner windows with de luxe equipment optional at extra cost.*

CHOOSE CHEVROLET TRUCKS FOR TRANSPORTATION UNLIMITED!

AT 45,000 FOOT ALTITUDE



OR AT SEA LEVEL...



These MICRO Precision Switches offer greatest capacity with small size

New! MICRO 1AT1 Toggle Switch

This momentary action toggle switch is a small, high capacity snap-action switch. It has been found valuable for such an application as jet motor control. The switch conforms with AN Drawings No. 3235-1 and 3235-2.

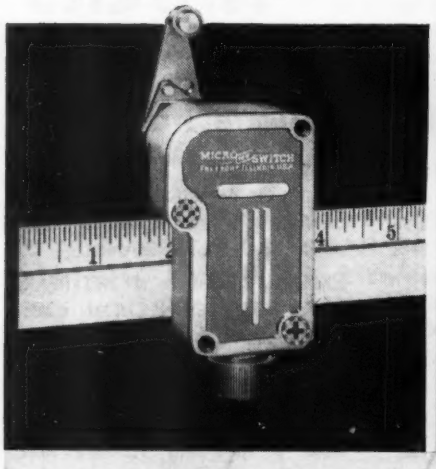
MICRO... first name in precision switches

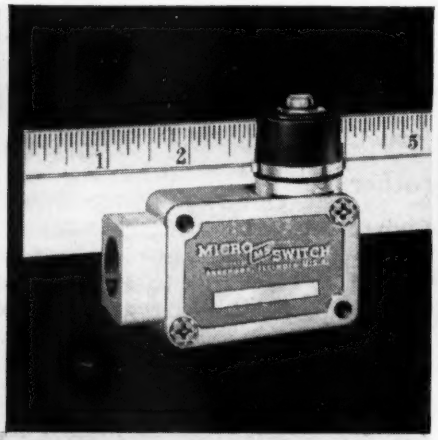
For more than a decade, the aviation industry has looked to MICRO SWITCH design engineers to supply the small precision switches, housings and actuators to meet their exacting needs.

This close cooperation has resulted in a continuing development of high capacity, precise-acting switch components which have made a major contribution to aircraft dependability.

On this page are shown a number of such MICRO SWITCH units, developed to meet specific needs, which have proved valuable in solving a number of design problems.

Aviation engineers are invited to make use of MICRO SWITCH "know-how" gained through long experience. We may have solved your problem for somebody else. Call a MICRO SWITCH engineer at one of the offices listed below . . . or write to us.





New! MICRO V3-1 Switch Housings

Rotary lever arm actuator adjustable through 360 degrees . . . total travel 90 degrees in either direction. This cast aluminum housing for the small V3-1 Switch has two mounting holes for mounting on either face.

Either one or two V3-1 switches may be enclosed in this aluminum die-cast housing. The sealed rubber protective boot is laboratory tested for aircraft purposes.

V3-1 MICRO Precision Switch—AN-3234

This small switch has d-c rating of 6 amperes, 28.5 volts at 45,000 feet, and 10 amperes, 28.5 volts, at sea level.

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MICRO MS SWITCH
A DIVISION OF FIRST INDUSTRIAL CORPORATION
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BRANCH OFFICES: Chicago • New York • Boston • Cleveland • Los Angeles

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NEWS DIGEST

DOMESTIC

Eight airlines which had proposed a $1 surcharge on all tickets, dropped plan when other trunk lines would not join. Airlines which had agreed to the fare increase, to be effective Mar. 15: American, Eastern, TWA, United and National; with Mid-Continent, Delta, and Braniff proposing the surcharge on routes competitive with the other five.

North American F-86 jet fighter, holder of the world's absolute speed record, was named "Sabre" by U. S. Air Force.

New passenger lift record was set by Caroline Mars, Martin-built Navy flying boat. Week after it flew 222 persons from San Diego to San Francisco (AVIATION WEEK, Mar. 7), plane flew the same 500-mi. route with 269 aboard.

Dr. Philip M. Morse was named research director and deputy director of the Weapons Systems Evaluation Group by Defense Secretary Forrestal. The Group is the top-level organization that studies tactical methods. Morse, professor of physics at the Massachusetts Institute of Technology, formerly was director of the Atomic Energy Commission's Brookhaven Laboratory.

FINANCIAL

Wright Aeronautical Corp. declared a first-quarter dividend of $1.25 a share on all capital stock outstanding, payable Mar. 28 to stockholders of record Mar. 17.

Boeing Airplane Co. declared a $1 dividend payable Mar. 29 to stockholders of record Mar. 15. Last previous dividend, also $1, was paid Apr. 7, 1948.

Lockheed Aircraft Corp. delivered $125,500,000 worth of airplanes in 1948 and returned to profitable operations, President Robert E. Gross said. Year's audit has not been completed. Military deliveries in 1948 were valued at $93,100,000, and commercial, $32,400,000. Future sales are expected to be 95 percent military. At year-end, Lockheed had $14,500,000 worth of commercial business.

FOREIGN

Vancouver International Airport control tower and administration building were destroyed by fire of undetermined origin. Loss was estimated at $150,000, with United Air Lines' and Trans-Canada Air Lines' losses totaling $20,000, and Canadian Pacific Airlines' loss put at $10,000. Temporary tower atop meteorological building permits operations to continue. New building, or more accessible location, is expected to cost $500,000.

INDUSTRY OBSERVER

► Saab Aircraft Co., Sweden, feeling that its twin-engine Scandia is not competitive with any U. S. plane now in production and is the only true DC-3 successor now being manufactured, is trying to interest a U. S. transport plane manufacturer in acquiring the rights to produce the Scandia under license.

► **Chance Vought's Cutlass (XF7U-1) is now being test flown at U. S. Air Force's Carswell AFB, Ft. Worth. The swept-wing, low aspect ratio twin jet Navy fighter has already unofficially exceeded the world speed record of 670 mph. set by a USAF North American F-86A fighter.**

► U. S. Air Force has not lost interest in the Northrop Flying Wing design despite recent cancellation of an order for 30 RB-49 jet-powered Wings. One of the 10 piston powered B-35s built by Northrop will be converted to jet power with two Northrop turbodyne 10,000 hp. turboprop engines, and four General Electric J-47 turbojet engines rated at 5000 lb. static thrust each. Other B-35s will be converted to turbojet power. Aeroproducts division of General Motors is building the propellers for the turbodyne.

► **Wright Aeronautical Corp.'s T-35 turboprop engine, originally scheduled for installation on Boeing's B-52 long range bomber, will not be put into production by the Air Force. Engine has been flying in a Boeing B-17 experimental installation. Navy is continuing development of the Allison T-40 and the Pratt & Whitney turboprop.**

► U. S. Air Force is giving manufacturers some double talk on inquiries regarding status of the Boeing XB-55 project. Inside word is that USAF has quietly washed out the project after it began to believe results of recent research on extension of turbojet engines ranges. XB-55 contract was awarded a Boeing design that looked much like the swept-wing XB-47 with turboprop engines instead of the B-47's turbojets. Meanwhile USAF is pondering a switch in Boeing's XB-52 from turboprop to turbojet power.

► **Air Materiel Command still prefers high octane gasoline as the best compromise for jet aircraft fuel. Kerosene with its higher btu is unavailable in quantities needed and has dangerous explosive tendencies. And gasoline is still needed for reciprocating engine planes anyhow.**

► An eight lb. aluminum foil fire-fighting suit has been tested at Wright Field within two ft. of a 1500 deg. F. gasoline fire. It is likely to be eventual replacement for 38 lb. asbestos fire suits for aircraft fires.

► **Replacement of crystals in VHF receivers by electro magnetic devices is being studied by Air Materiel Command's Electronics division, to overcome a shortage of crystals experienced in World War II when the crystals were flown into U. S. from Brazil.**

► Contract for research and development in "the general field of nuclear reactor technology" has been awarded to North American Aviation, Inc., by the U. S. Atomic Energy Commission.

► **Piasecki's new all-metal version of the HRP-2 transport helicopter being built for the Navy and Marines has also attracted interest from the Air Force. USAF is considering the HRP-2 for rescue work since it has the capacity to evacuate an entire bomber crew from the scene of a crash.**

► Convair reports that foreign and domestic airlines have now accepted 134 Convair-Liners. Latest score on acceptances: American 73 on an order of 75; PanAm, 20; Western, 10; KLM, 12; Continental, 5; Trans-Australia, 5; Swiss Air Lines, 4; CATC of China, 3 on an order of 6; Sabena, 1 on order of 6; and Northeast Airline, 1 on an order of 5.

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AVIATION WEEK

March 14, 1949

UNHEALTHY APPROACH—Interceptors chasing the B-36 run into the bomber's heavy tail armament, shown here in unusual view.

Improved B-36 Is Planned by Strategists

Big bomber in top spot on Air Force program after performance exceeds estimates.

By Robert Hotz

Top U. S. Air Force strategists are counting on the Convair B-36 bomber as the sledgehammer of their intercontinental strategic bomber force for at least another six years.

Developmental program now under way is aimed at improving performance of the B-36 series to a peak of 500 mph. true air speed at an altitude of 50,000 ft. Present performance of the B-36B with full equipment and 10,000 lb. bomb load is 372 mph. true air speed at 40,000 ft.

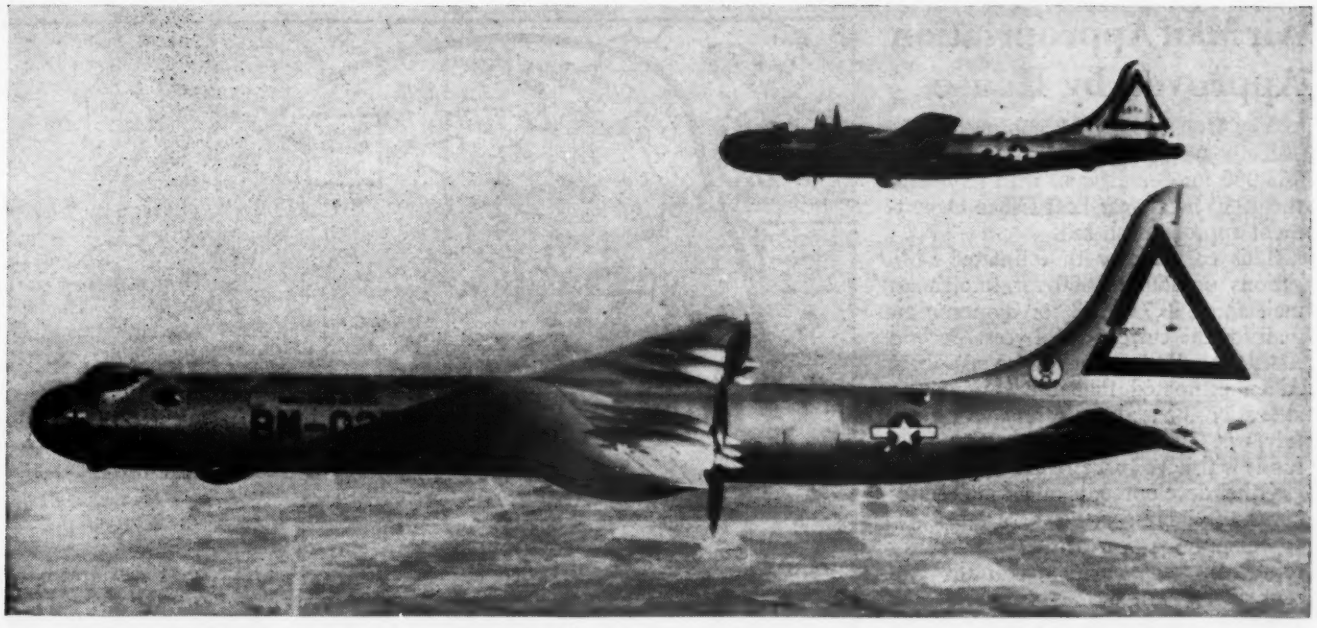
► **Jet Pods**—Next step will be the B-36D (AVIATION WEEK, Jan. 17) with four General Electric J-47 turbojet engines, rated at 5000 lb. static thrust, added to the present power of six Pratt & Whitney R-4360-41 piston engines rated at 3500 hp. Addition of four jet engines paired in "pod" nacelles identical to those now used on the Boeing B-47 is expected to boost performance to 435 mph. true air speed at 45,000 ft. Prototype B-36D is in final stages of completion at Convair's Ft. Worth plant and is expected to make its first test flight in April.

Beyond the B-36D, projects are still in the planning stage, but top level discussions have included use of the Allison T-40, 5500 hp. turboprop and sweepback of the B-36 wing to permit operations at higher Mach numbers than the limit imposed by the present design.

► **Production Plans**—Production plans now call for Convair to build a total of 134 of the B-36 series at Ft. Worth. Presidental certification of an addition $300 million in USAF procurements funds last week gave the green light on the final increment of the 39 B-36s plus modification of all 134 planes to take the jet pods. Convairs has now built 54 of its original order for 95 planes and is averaging one complete bomber per week. Production plus modifications are expected to keep the Ft. Worth plant busy until the beginning of fiscal 1951.

An extensive modification program will include: Beefing up the wings of all planes to take jet pods; new type bomb-bay doors; all-metal control surfaces; adding armament and 3500 hp. piston engines to the 22 model As; and equipping one group of RB-36s for strategic photo-reconnaissance.

► **Boost Gross**—The jet pods are designed so they can be attached to the B-36 wingtips in less than two hours. They will not be used for all missions but are expected to boost the maximum takeoff gross to 358,000 lb. They will



HOW BOMBERS GROW—B-29 (background), the heavy bomber of World War II, is a medium bomber since the B-36 appeared.

permit a larger fuel load on takeoff; a shorter takeoff run; faster climb to altitude and speed increase at bombing altitudes. Addition of turbojets will reduce range by less than 300 miles.

Present top spot of the B-36 in USAF plans is a sharp reversal from its previous postwar role as an alleged "sitting duck" and costly "white elephant" that was held in such low regard that orders were once actually issued (but never executed) to cancel the entire project.

This radical shift has been due to two factors:

Actual performance record of the B-36 types which have now accumulated a total of more than 3500 hours of actual flight time and have far exceeded original Convair performance guarantees.

Discovery of deficiencies of jet fighters at the 40,000 ft. bombing altitude of the B-36. A series of test interceptions pitting the Lockheed F-80C, Republic F-84 and the North American F-86A against the B-36B has indicated that the jet fighters are unable to make significant percentage of successful attacks on the bomber and never have been able to make an interception until after the bomber reached its target and dropped its bomb load.

These B-36 vs. jet fighters tests conducted over Florida and California have resulted in a thorough revision of USAF fighter plane requirements and have jarred the generally-accepted postwar theory that jet fighter development had given the defense a marked edge over piston-engine bombers.

► **New Area**—Key to the present role of the B-36 is its performance at 40,000 ft. and above, shifting the fighter-bomber battle into the tropopause, an area that has never before been thoroughly explored.

At altitudes of 40,000 ft. and above, efficiency of present jet engines falls off much more rapidly than does efficiency of the turbo-supercharged piston engines of the B-36. Jet fighters have only 80 to 100 mph. speed advantage over the bomber. This margin has proved insufficient to make anything but tail-cone passes at an extremely slow rate of closure in the face of heavier defensive armament.

► **Fighter Stalls**—The low wing-loading of the B-36 makes it possible for it to outmaneuver the fighters which have higher wing loading. Fighters margin between top speed and stalling speed is extremely narrow at 40,000 ft. restricting them to shallow 15 deg. turns.

Rate of climb of present jet fighter types to 40,000 ft. is not fast enough to allow them to intercept the B-36 before it reaches its target and drops bombs. Early warning radar gives less than 30 minutes warning of a B-36 approach while fighters take 26 minutes to reach 40,000 ft. Even on days when B-36 contrails are clearly visible from the ground jet fighters have been unable to climb to 40,000 ft. in time to position themselves for an attack before the bomber made its drop.

► **Performance Record**—Performance of the B-36B to date includes:

Two 12 hour missions flown entirely at 40,000 ft. except for climb after takeoff and descent for landing.

An 8400-mile mission from Ft. Worth to Hawaii dropping 10,000 lb. off Honolulu and returning with 2800 gal. of gas.

A maximum bomb load of 84,000 lb. carried halfway on a 3100-mile mission with bomb drops made from 35,000 ft. and 40,000 ft. and return at 30,000 ft.

An 8100-mile mission dropping 10,000 lb. of bombs at the halfway mark and averaging ground speed of 223 mph., returning with a 5 percent fuel reserve.

The original B-36 design was the work of Convair engineers headed by Ralph Bayless and Robert Widmer. It was submitted to the Air Force in August, 1941. Contract for 100 B-36s at a total cost of $160,170,000, not including government furnished equipment, was approved in August, 1943. This contract was cut back to 95 planes early in 1947 with cancellation of the entire project ordered later. Only the actual flight performances of the first B-36As to roll off the Convair line in the fall of 1947 averted the cancellation and reinstated the B-36 project.

B-36 TEAM—J. W. Larson (left) and R. C. Sebold were key men in development of bomber. Sebold is new Convair chief engineer, with Larson succeeding him as chief engineer at Ft. Worth division.

Air Mail Appropriation Approved by House

The House last week approved $45,308,000 for foreign air mail and $41,753,000 for domestic air mail service in the 1950 fiscal year Post Office Department appropriation bill.

This compares with estimated obligations of $60,366,000 for foreign air mail and $50,710,952 for domestic air mail for the current fiscal year. Second Assistant Postmaster General Paul Aiken estimated that the coming-year allocations, based on estimates of last July, will fall far short, and supplemental funds will have to be requested later.

Other developments on air mail funds on Capitol Hill:

• **An appropriation of $17 million** for foreign air mail payments for the current fiscal year was approved by the House in a deficiency bill, now pending before the Senate. The $17 million plus $635,493 the Department has available for reallocation, would go to Pan American Airways (North Atlantic), $5,562,376; American Overseas (North Atlantic), $3,701,018; Transcontinental and Western Air (North Atlantic), $7,470,868; Colonial Airlines (New York-Bermuda), $162,127; PAA (New York-Buenos Aires), $115,332; American Airlines (Fort Worth-Mexico City), $14,336; Eastern Airlines (Miami-San Juan), $16,803; National Airlines (Miami-Havana), $8933; foreign flag carriers, $582,800.

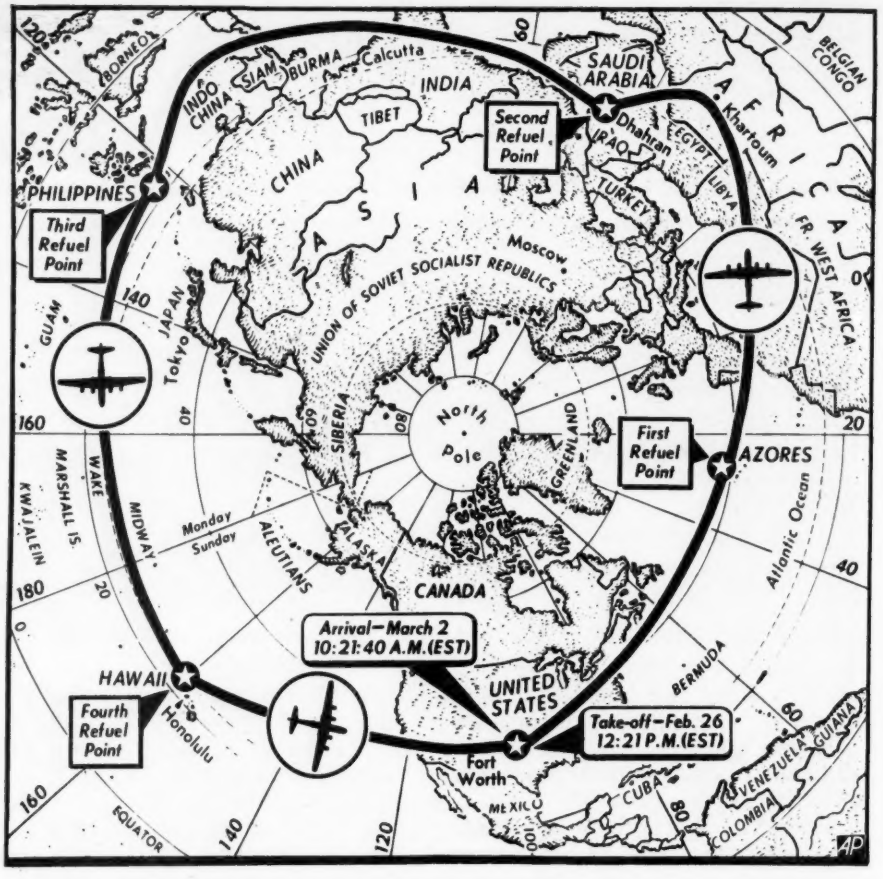
• **An additional $20,906,600** was requested from the Senate by the President for foreign air mail payments to the deficiency measure—$13,441,000 for the 1949 fiscal year; $2,563,000 for the 1948 fiscal year; $4,172,000 for the 1947 fiscal year; and $730,000 for the 1946 fiscal year. Of the total, $20,329,718 is the amount CAB estimates will be required to meet rate increases that are to be granted through Sept. 30 of this year.

• **A deficiency appropriation** for Alaska air mail Star route service of $718,000 for the 1948 fiscal year, $269,500 for the 1947 fiscal year; and $303,600 for the 1946 fiscal year, necessitated by CAB rate increase awards, was also requested by the President.

Academy–But Where?

President Truman's recommendation for the establishment of a National Air Academy has stepped up a tug-of-war in Congress over its location.

Ten bills have been introduced authorizing an Air Academy at Randolph Field, Tex.; Salina, Kans.; "The Southern District" of California; Sedalia Airfield, Mo.; Enid Air Force Base, Okla.; in the vicinity of Arkansas City, Kans.; Hutchinson, Kans.



Mid-air refueling technique which made nonstop route possible largely hinges on . . .

Globe Hop Sets B-50's New Role

Nonstop flight confirms claims that refueling puts all medium bombers in the intercontinental classification.

Non-stop round the world flight of a Boeing B-50A bomber using aerial refueling techniques had strong military and political repercussions last week.

Air Secretary W. Stuart Symington confirmed AVIATION WEEK's earlier statement on Feb. 28 that the Boeing B-50 series would become part of U.S. Air Force's intercontinental bomber force as a result of the successful application of aerial refueling to its operations. Speaking in Ft. Worth just after the B-50A completed its 23,452 mile round-the-world nonstop flight, Symington said:

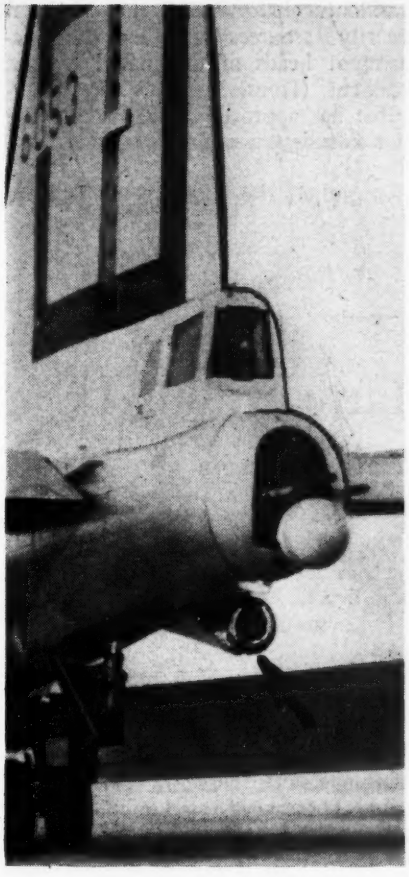
"This means that all our medium bombers (B-50 series) are now intercontinental bombers."

► **Political Support**—Political repercussions pointed to a strengthening of USAF's case on Capitol Hill. Key Congressional leaders indicated they were impressed with the B-50A performance as substantial proof of USAF's claims regarding its ability to conduct intercontinental bombing operations without the use of advance foreign bases.

The Boeing B-50A Lucky Lady II completed its 23,452 mile flight in 94 hr. 1 min. with four aerial refuelings (AVIATION WEEK, Feb. 21) and a total gas consumption in excess of 56,000 gal. Aerial refuelings were made by modified Boeing B-29 tankers over the Azores; Dhahran, Arabia; Clark AFB, Philippines; and Hawaii.

► **239 Mph Average**—Two tankers were required to refuel the B-50A with a third tanker standing by during each refueling. A final trio of B-29 tankers accompanied the Lucky Lady II on its final leg from Tucson, Ariz. to Ft. Worth but did not transfer fuel. Average ground speed for the entire trip was 239 mph.

Best indication of the significant military performance of the B-50A was given on the first two legs from Ft. Worth to Dhahran. With its initial takeoff load and one refueling over the Azores, the B-50A flew 9189 statute miles and arrived over Dhahran with a fuel reserve good for 5 hr. 45 min. Subtracting 1600 gal. of gas to get the equivalent of a 10,000 lb. bomb load would leave the B-50A with sufficient



. . . this aperture for hose in tail of B-50.

Log of Lucky Lady II (Boeing B-50A)

	CST	Date	Miles	Elapsed Time	Average Speed
Depart Fort Worth	11:21 am.	Feb. 26			
Arr. Azores	2:55 am.	Feb. 27	3884	15:34	250 mph.
Arr. Dhahran	10:30 pm.	Feb. 27	9189	35:09	270
Arr. Philippines	7:00 pm.	Feb. 28	14,178	55:39	242
Arr. Hawaii	6:15 pm.	Mar. 1	19,642	78:54	242
Arr. Fort Worth	9:22 am.	Mar. 2	23,452	94.01	231

fuel to complete 10,000 miles carrying the 10,000 lb. bomb load half way. The Lucky Lady II carried bomb bay fuel tanks and no bomb load.

► **Engines Fine**—The four Pratt & Whitney Wasp Major engines functioned smoothly during the entire 94 hour trip. Weather was excellent with only four hours of instrument flying during the entire trip. SAC headquarters maintained tactical contact of the plane with hourly communications averaging 45 minutes for transmission of messages between LeMay's headquarters in Omaha and the Lucky Lady II in flight. Three of the four refueling contacts were made visually with the fourth made using an airborne radar beacon. Refueling techniques were those described in detail in AVIATION WEEK, Feb. 21.

The operation revealed that SAC now has B-29 tanker squadrons in operational service. The 12 tankers required for the round the world mission were in place at the Azores, Dhahran, Clark AFB, and Hawaii less than 10 days after the operational order for the mission was received at their Tucson, Ariz. base.

► **390 On Order**—USAF now has 390 B-50s on order. All will be equipped with refueling devices. Boeing's Seattle plant is now producing them at the rate of about a dozen per month. The B-50A has a design gross weight of 140,000 lb.; wingspan of 141 ft.; length of 99 ft. and is powered by four Pratt & Whitney R-4360 engines rated at 3000 hp. Top speed is about 385 mph.

B-50B features a beefed-up wing. B-50C is powered by a Pratt & Whitney VDT powerplant with greatly superior performance to the A and B models. This bomber has been redesignated as the B-54A. The B-50D represents only slight modifications over the B model with performance remaining about the same.

The B-50 series has a service ceiling of more than 30,000 ft. and a maximum bombload of 20,000 lb. Without refueling it can carry a 10,000 lb. bomb load over a 6000 mile range.

Johnson: Friend of Air Power

Incoming defense chief known for past support of aviation industry.

Appointment of Louis A. Johnson, 58, of Clarksburg, W. Va. as Secretary of National Defense to replace James V. Forrestal was generally hailed in aviation circles as insuring more favorable consideration of air power in the defense structure. Johnson will take office Mar. 31.

Johnson resigned last week as a director of Consolidated Vultee Aircraft Corp. His law firm of Steptoe and Johnson represents Slick Airways, all cargo line with headquarters in San Antonio, Tex.

► **Wide Experience**—The new defense secretary has had extensive experience both in military affairs and aviation. He served as Asst. Secretary of War during the second Roosevelt administration from 1937-1940 and was extremely active during that period in pushing the expansion of the American aircraft industry to meet the needs of Great Britain and France in addition to those of the U. S. Army Air Corps.

Johnson also made many speeches during this period stressing the vital importance of expanded air power in the national defense structure and was often assailed as "a warmonger" for his strong stand on military preparedness.

► **Support Air Corps**—During this period Johnson also became involved in the controversy over the air cooled vs. liquid cooled aircraft engine and was one of those responsible for development of American production of liquid cooled engines. He was also a leading figure in the controversy over development of the Boeing B-17 Flying Fortress and supported the Air Corps position on the need for long range bombers against bitter opposition by the Navy and Ground Force elements in the War Department.

Louis A. Johnson

Johnson was also an outspoken advocate of industrial mobilization and began the first practical steps toward large-scale industrial participation in the defense program several years before Pearl Harbor. He was a leading figure in development of the American Legion's postwar air power program.

Johnson served as national commander of the American Legion, and was President Roosevelt's special envoy to India in 1942.

More Powers Asked For Defense Secretary

President Truman last week asked Congress to increase the powers of the Secretary of Defense and tighten his control over the defense organization.

The President's recommendations, partially carrying out the proposals of the Commission on Government Organization, headed by former President Herbert Hoover, were:

- **That the present authority** of the Secretaries of Army, Navy, and Air Force to appeal to the President over the head of the Secretary of Defense be voided, and the three service Secretaries "administer . . . (their) departments under the authority, direction and control of the Secretary of Defense."
- **The "National Military Establishment"** be converted into an orthodox executive department known as the "Department of Defense," with the Army, Navy, and Air Force "designated as military departments" within the overall department.
- **Secretary of Defense** be provided with an Undersecretary of Defense and three assistant Secretaries. (The House Armed Services Committee has approved legislation creating an Undersecretary).
- **The Joint Chiefs of Staff** be presided over by a "chairman" reporting to the Secretary of Defense and the President, who would "take precedence over all other military personnel."
- **The Secretary of Defense** be the sole representative of the Department of Defense on the National Security Council, the nation's top policy group, assigned the function of coordinating domestic, civilian and military, and foreign programs.

The three service secretaries are now members of the council. Others are the President, chairman of the National Security Resources Board, and other department heads as designated by the President. (House Armed Services Committee has approved a bill making the Vice President a member of the council).

- **Control of the Secretary of Defense** over the Munitions Board and the Research and Development Board be tightened.

Odom Sets Lightplane Record

Second attempt in Bonanza at 5000-mile course from Honolulu to New York is completed in 36 hr., one min.

A friendly 25 mph. wind blowing east out of Hawaii made the difference between success and failure for Capt. Bill Odom in his second attempt to fly a Beech Bonanza nonstop 5000 miles from Honolulu to New York.

The Bonanza, powered with a 185 hp. Continental engine, had only 14 gal. of fuel left when it touched down at Teterboro Air Terminal, where Odom was greeted by Walter H. Beech, president of the aircraft company bearing his name, and a crowd of enthusiastic spectators.

Odom had started with 288 gal. of fuel, including the regular 40 gal. tankage and 248 gal. in special cabin and wing tanks.

Plan was reported weighing 3779 lb. nearly 100 lb. below the 3862 lb. maximum for the FAI plane weight category in which Odom was competing.

The achievement is expected to give Odom a clear world record in the FAI lightplane classification for nonstop flight. There were some unofficial challenges of the earlier record claimed in the same category for his Jan. 13 flight of 2406.9 miles from Honolulu to Oakland. Challenges were based on two European nonstop lightplane flights

On his earlier flight (AVIATION WEEK, Jan. 24) Odom was forced back by icing conditions after he had climbed to 14,000 ft. over Reno, Nevada.

Odom avoided weather trouble on his second flight by swinging northeast from Oakland to escape a storm over the Sierra Nevada mountains. His route:

Across northern California and southern Oregon to Boise, Idaho at 8:24 p.m. Mar. 7; to Rock Springs, Wyo. at 11:26 p.m.; to Omaha, Neb. at 4:42 a.m.; across Iowa and Illinois to Cleveland at 9:11 a.m.; across Pennsylvania, reporting over Easton at 11:35 a.m. and ariving at Teterboro at 12:06 p.m. Mar. 8.

He had started from Honolulu at 12:05 a.m. Mar. 7.

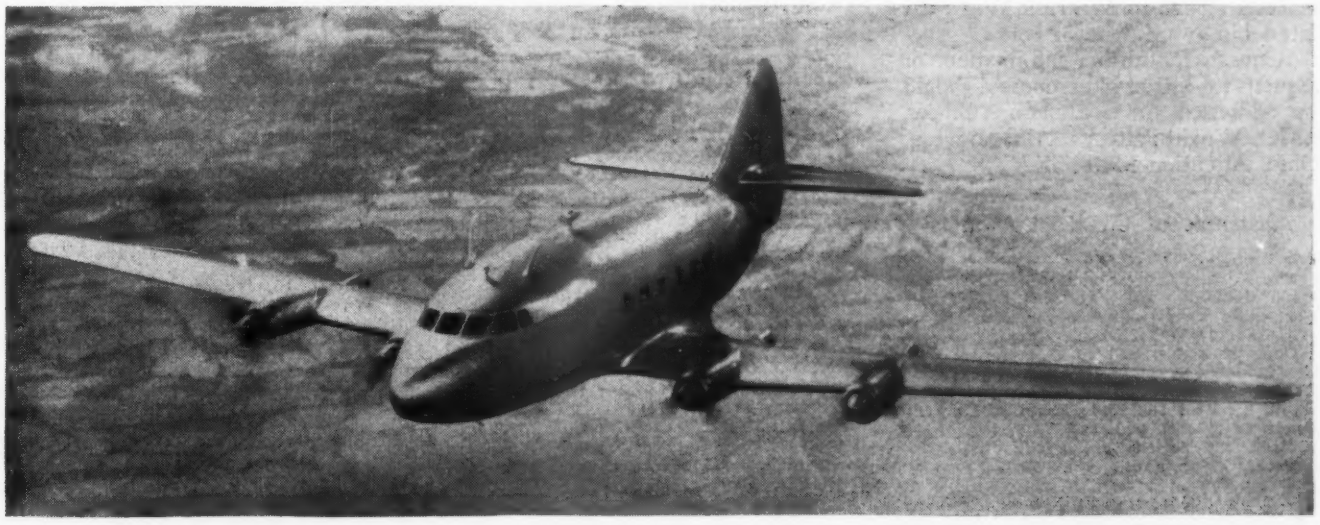
Odom wore a business suit on the trip, and shaved himself and changed shirts as he passed over Cleveland in preparation for the welcoming ceremony at Teterboro.

STUDY IN TRIANGLES

This vertical view of the Convair Delta-wing Model 7002 dramatizes its unique configuration. Sweepback of the wing's leading edge to 60 deg. is calculated to delay supersonic speed drag, but offers stability difficulties at low speed. The all-metal Model 7002, powered by an Allison J-33 turbojet engine, will be used only for low-speed (400-450 mph.) stability tests (Aviation Week, Mar. 7).

Another Airlift

When the isolated coastal village of Neah Bay (extreme northwest corner of Washington state) was cut off from the outside by flood waters that washed out the only highway, Coast Guard PBYs took over the job of flying in supplies. They delivered more than 29,000 lb. of food, mail, supplies and equipment during a 10-day period.



Apollo Turboprop Transport Nears Trials

Medium-range craft will carry 31 passengers and is Britain's first plane designed for new powerplant.

Britain's first commercial air transport specifically designed for turboprop power is nearing completion at the Armstrong Whitworth Coventry plant.

The Apollo will be powered by four Armstrong Siddely Mamba II turboprops; has a gross weight of 39,500 lb.; and will accommodate 31 passengers or 7500 lb. of freight in its pressurized cabin. It is designed to cruise at 305 mph. at 20,000 ft.

► **Basic Specs**—It is apparently designed to do the type of work now being done on U. S. airlines by the Convair-Liner and Martin 2-0-2, both of which have a slower speed but carry 40 passengers.

Basic specifications of the Apollo: 70 ft. length; 92 ft. wingspan; 986 sq. ft. wing area; maximum height 25 ft. It has a retractable tricycle landing gear with double wheels on nose and main struts. Performance includes: takeoff to clear a 50 ft. obstacle 2700 ft. with a maximum gross of 39,500 lb. and 2400 ft. with 37,000 lb. gross; still air range of 1500 miles at 20,000 ft.; 2100 ft. per minute rate of climb on four engines and 1300 fpm. on three engines.

► **Cabin Details** – The circular semi-monococque fuselage has two forward baggage compartments, a main passenger cabin seating from 24 to 31 passengers in double seats on each side of a center aisle. Behind the passenger cabin are two lavatories, a galley, a coat rack and a third freight compartment. Headroom of 6 ft. 8 in. is offered down the center aisle. Thermal deicing system is provided for wings, and tail with electrical deicers on the propellers.

Deliveries Near For Westland-Sikorsky

British version of the Sikorsky S-51 helicopter is coming off the assembly lines of Westland Aircraft, Ltd., with the Royal Navy and commercial interests slated to take delivery on the craft shortly.

Westland has built and flown four S-51s, and present production plans will keep the company busy on the project for many months. Under its contract with Sikorsky Aircraft division of United Aircraft Corp., the British licensee has the right to market the Westland-Sikorsky S-51 in all parts of the world except the United States and Canada.

► **Different Engine Used**—Principal difference between the British and American versions is the substitution of the 525 hp. Alvis Leonides air-cooled radial engine for the 450 hp. Pratt & Whitney Wasp Junior. The added horsepower is expected to boost performance slightly.

While the Westland-Sikorsky is very similar to the American original, it must pass the customary tests for its British certificate of airworthiness. These tests for commercial usage are nearly complete, and the certificate should be issued by the end of March. British military helicopters need no certificate, so deliveries to the Royal Navy will start as soon as special equipment called for is installed.

Both the Royal Navy and Pest Control, Ltd., one of several commercial companies interested in the Westland-Sikorsky, have had extensive experience with American-built S-51s. The helicopter unit of British European Airways also has used the U. S. craft.

Packard Plant Closes

Reductions in Air Force appropriations for aircraft engine experimentation were cited as the reason for the recent closing of the Packard Motor Car turbojet engine development plant at Toledo, Ohio. The shut-down order was a surprise to all except top officials among 475 engineers and technicians.

There are no immediate plans for use of the 367,000 sq. ft. plant. Arthur Nutt, manager of the plant for Packard and former vice president of Curtiss-Wright Corp., stated that the Air Force decision was made after a review of all research and development projects with an eye toward the necessity of maintaining a balanced program. Higher priority, he said, was given engines needed for new projects now being developed. Nutt added that the Air Force was completely satisfied with progress of gas turbine development work done at the Toledo plant.

Latest Bid Awards to Industry by U. S. Air Force

For convenience of present and prospective Air Force suppliers, Air Materiel Command Procurement Division makes available to AVIATION WEEK the latest bid awards, shown below.

Requests for further information, or requests for lists of bid proposals, should be addressed to Contracting Officer, AMC, Wright-Patterson AFB, Dayton, Ohio, Attention MCPPSX2.

Abstracts of Contract Awards

For 1 shear (IFB 49-540):
The E. A. Kinsey Co., Cincinnati, O., on a bid of $7512.

For cable assy-engine, cover assy-engine (IFB 49-579):
Companies sharing—The J. Pedersen Mfg. Co., Bridgeport, Conn., on a bid of $5162.66; Columbus Production Mfg. Co., Columbus, O., on a bid of $8250.40; Franklin Machine Products Co., New York, N. Y., on a bid of $5801.25; Acorn Tool & Mfg., Inc., Cincinnati, O., on a bid of $3890.19; Stanley Aviation Corp., Buffalo, N. Y., on a bid of $183.98 and Kansas City Metal Products Co., Kansas City, Mo., on a bid of $2363.10.

For 200 indicators airspeed (IFB 49-607):
Square D Co., Kollsman Instrument Div., Elmhurst, N. Y., on a bid for $24,684.

For wax (IFB 49-585):
Companies sharing—The Wingwax Co., Dayton, O., on a bid of $24,426; and Inland Rubber Co., Chicago, Ill., on a bid of $3528.

For blotter, board, mount, preserver, tissue (IFB 49-611):
Companies sharing — Mathers-Lamm Paper Co., Washington, D. C., on a bid of $2361.90; Charles T. Bainbridge's Sons, Brooklyn, N. Y., on a bid of $14,070; Chicago Cardboard Corp., Chicago, Ill., on a bid of $730.62 and Merchants Paper Co., Inc., Cincinnati, O., on a bid of $3911.71.

For orthodichlorbenzene, ethylene dichloride and trichloretylene (IFB 49-619):
Companies sharing—The Dow Chemical Co., Midland, Mich., on a bid of $76,797.40; Detrex Corp., Detroit, Mich., on a bid of $2239.38; E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., on a bid of $149,787.30; The Ulylite Corp., Detroit, Mich., on a bid of $4940 and Amsco Products Co., Cincinnati, O., on a bid of $1709.40.

For coil (IFB 49-625):
Companies sharing—Radio Coils, Chicago, Ill., on a bid of $1670.51; Electronic Transformer Co., Inc., New York, N. Y., on a bid of $726 and Coil Winders, Inc., Brooklyn, N. Y., on a bid of $9629.

For adapter, clamp, cross, elbow, etc. (IFB 49-644):
Companies sharing — Cannon-Kocka Co., Cleveland, O., on a bid of $1012; Continental Screw Co., New Bedford, Mass., on a bid of $246.33; The Aircraft Fitting Co., Cleveland, O., on a bid of $442.75; Wittek Mfg. Co., Chicago, Ill., on a bid of $1575.96; Commercial Surplus Sales Co., Baltimore, Md., on a bid of $109.03; Adel Precision Parker Appliance Corp., Cleveland, O., on Products Corp., Huntington Div., Huntington, W. Va., on a bid of $856.23; The a bid of $2622; The Weatherhead Co., Cleveland, O., on a bid of $3657; The Deutsch Co., Los Angeles, Calif., on a bid of $15,548; Elastic Stop Nut Corp. of America, Union, N. J., on a bid of $38.18; George K. Garrett Co., Inc., Philadelphia, Pa., on a bid of $98.72 and Kohler Co., Kohler, Wis., on a bid of $30,107.

For compressor, air (IFB 49-663):
The Davey Compressor Co., Kent, O., on a bid of $57,735.

For 135 each coupling-brass tank car (IFB 49-672):
Buckeye Iron & Brass Works, Dayton, O., on a bid of $2733.75.

For 101 each trainer, mock-up aneroid instrument (IFB 49-673):
Stanley Aviation Corp., Buffalo, N. Y., on a bid of $3030.

For blackboard (IFB 49-701):
The Ohio Valley Slate Co., Cincinnati, O., on a bid of $25,481.28.

For receiver-transmitter AT-11, control box, etc. (IFB 49-708):
Wilcox Electric Co., Inc., Kansas City, Mo., on a bid of $400,818.95.

For steel-chrome (IFB 49-722):
Companies sharing—Jessop Steel Co., Washington, Pa., on a bid of $202,134.93 and Eastern Stainless Steel Corp., Baltimore, Md., on a bid of $142,239.45.

For indicator (IFB 49-726):
American Machine & Metals, Inc., U. S. Gauge Div., Sellersville, Pa., on a bid of $30,696.

For glass (IFB 49-731):
Pittsburgh Plate Glass Co., Pittsburgh, Pa., on a bid of $51,770.

For 14,514 each belt assembly (IFB 49-745):
Aerial Machine & Tool Corp., Long Island City, N. Y., on a bid of $54,862.92.

For rivets (IFB 49-769):
The Dill Mfg. Co., Cleveland, O., on a bid of $25,452.32.

For connector, elbow, fitting assy., etc. (IFB 49-806):
Companies sharing—The Aircraft Fitting Co., Cleveland, O., on a bid of $902; Ohlson International Corp., Ohlson-Empire Div., Long Island City, N. Y., on a bid of $172.50; The Parker Appliance Co., Cleveland, O., on a bid of $3170; The Weatherhead Co., Cleveland, O., on a bid of $6049; MacWhyte Co., Kenosha, Wis., on a bid of $105; and Air Associates, Inc., Teterboro, N. J., on a bid of $245.

For lacquer and coating (IFB 49-811):
Companies sharing—Andrew Brown Co., Los Angeles, Calif., on a bid of $1940.16 and The Glidden Co., Cleveland, O., on a bid of $744.

For benxothriazole, hydroquinone (IFB 49-824):
Companies sharing—The Edwal Laboratories, Inc., Chicago, Ill., on a bid of $1204.15 and Industrial Distributors, Inc., New York, N. Y., on a bid of $2981.52.

For dolly truck wheel and lifter (IFB 49-825):
Companies sharing—Weaver Mfg. Co., Springfield, Ill., on a bid of $6652 and Walker Mfg. Co. of Wisconsin, Racine, Wis., on a bid of $5042.

For bar-boring, various sizes (IFB 49-830):
Atlantic Hardware & Supply Corp., on a bid of $4282.50.

For 222 each Intervalometer and counter (IFB 49-833):
Abrams Instrument Corp., Lansing, Mich., on a bid of $65,068.31.

For tape, adhesive (IFB 49-835):
Companies sharing—Minnesota Mining & Mfg. Co., St. Paul, Minn., on a bid of $65,874.46; Industrial Tape Corp., New Brunswick, N. J., on a bid of $14,765.47 and Chicago Show Printing Co., Mystik Adhesive Products Div., Chicago, Ill., on a bid of $143,074.55.

For sodium phosphate, trisodium phosphate, etc. (IFB 49-840):
Companies sharing—The American Agricultural Chemical Co., New York, N. Y., on a bid of $3250; Blockson Chemical Co., Joliet, Ill., on a bid of $9402.80; Thompson-Hayward Chemical Co., Kansas City, Mo., on a bid of $1229; E. I. du Pont deNemours & Co., Wilmington, Del., on a bid of $31,663.78; Allied Chemical & Dye Corp., General Chemical Div., New York, N. Y., on a bid of $4652; Mathieson Chemical Corp., New York, N. Y., on a bid of $22,550 and Octagon Process, Inc., Brooklyn, New York, on a bid of $4450.

For screws (IFB 49-849):
Companies sharing—Reed & Prince Mfg. Co., Worcester, Mass., on a bid of $3442.47; American Screw Co., Providence, R. I., on a bid of $63.52; National Lock Co., Rockford, Ill., on a bid of $55.64; Air Associates, Inc., Teterboro, N. J., on a bid of $145.52; The E. W. Ferry Screw Products Inc., Berea, O., on a bid of $729.60; Continental Screw Co., New Bedford, Mass., on a bid of $578.69; and E. M. Joesam Co. Inc., Boston, Mass., on a bid of $37.40.

For screws (IFB 49-850):
Companies sharing—Reed & Prince Mfg. Co., Worcester, Mass., on a bid of $5502.13; The National Screw & Mfg. Co., Cleveland, O., on a bid of $116.25 and American Screw Co., Providence, R. I., on a bid of $19.65.

For button, clip, eyelet, ring, etc. (IFB 49-890):
Rau Fastener Co., Providence, R. I., on a bid of $1572.07; United-Carr Fastener Corp., Carr Fastener Co., Cambridge, Mass., on a bid of $2775.40 and Aero Bolt and Screw Co., New York, N. Y., on a bid of $96.50.

For fittings, fuel hose, packing hose, etc. (IFB 49-869):
Companies sharing—United States Rubber Co., New York, N. Y., on a bid of $13,627.50; The Goodyear Tire & Rubber Co., Akron, O., on a bid of $37,691.94 and E. F. Houghton & Co., Philadelphia, Pa., on a bid of $1442.10.

For parts for aircraft camera (IFB 49-910):
Fairchild Camera & Instrument Corp., Jamaica, N. Y., on a bid of $6359.94.

For 266 each pump, 200 G.P.H. (IFB 49-919):
Borg-Warner Corp., Pesco Products Div., Cleveland, O., on a bid of $15,158.

For seat assembly-cushion assembly (IFB 49-921):
Technicraft Corp., Kansas City, Mo., on a bid of $13,617.63.

For hose assembly, flexible (IFB 49-935):
The Weatherhead Co., Cleveland, O., on a bid of $9090.

For plate assembly (IFB 49-927):
Companies sharing—Mica Insulator Co., Schenectady, N. Y., on a bid of $150; Industrial Precision Products Co., Chicago, Ill., on a bid of $133; Frampton Electrical Equipment Co., Dayton, O., on a bid of $3597 and The Stanhope Products Co., Brookville, O., on a bid of $205.

For 1,777 each fire extinguishers (IFB 49-938):
Walter Kidde & Co., Belleville, N. J., on a bid of $39,829.24.

For 215 each bulb electrical resistance (IFB 49-955):
Weston Electrical Instrument Corp., Newark, N. J., on a bid of $2527.35.

For 1449 each safety belt (IFB 49-962):
Aerial Machine & Tool Corp., Long Island City, N. Y., on a bid of $4956.70.

For 1773 aircraft accelerometers (IFB 49-181):
Square D Co., Elmhurst, N. Y., on a bid of $119,568.30.

For electronic equipment (IFB 49-70):
Companies sharing—Rogers Industries, Inc., New York, N. Y., on a bid of $35,290.57; L. R. Dooley, Inc., New York, N. Y., on a bid of $7345.80; Joseph Weidenhoff, Inc., Algona, Iowa, on a bid of $2077.46; Eltron, Inc., Jackson, Mich., on a bid of $50,285.33; Winslow Co., Newark, N. J., on a bid of $71,583.60 and Great American Industries, Inc., Meriden, Conn., on a bid of $59,665.12.

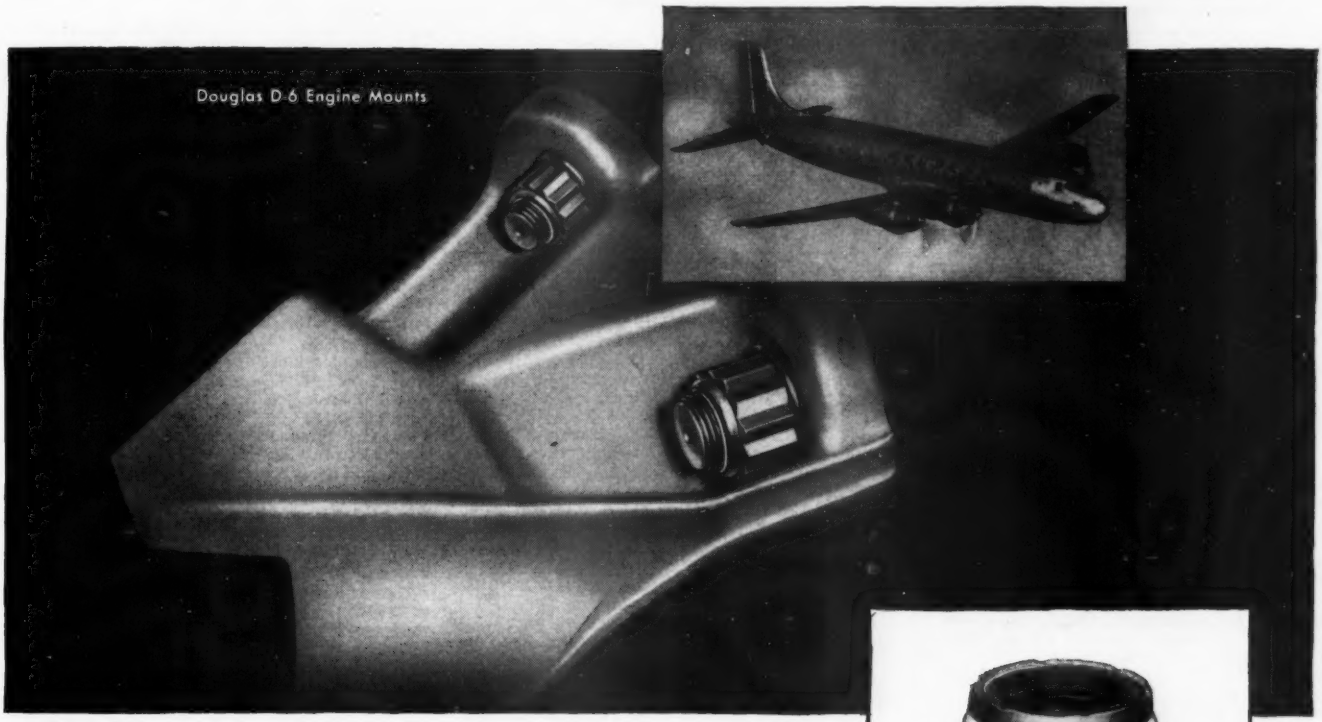
For wiping cotton cloth (IFB 49-123):
Companies sharing—Southern Waste Material Co., Inc., Dallas, Tex., on a bid of $100,260; American Sanitary Rag Co., Chicago, Ill., on a bid of $179,800; Leshner Corp., Hamilton, O., on a bid of $65,831, and Rothschild & Co. Atlanta, Ga., on a bid of $5385.

For 200,000 steel drums (IFB 49-146):
Companies sharing—Cleveland Steel Barrel Co., Cleveland, O., on a bid of $446,250, and Myers Drum Co., Oakland, Calif., on a bid of $781,250.

For 10,136 pneumatic rafts (IFB 49-164):
Companies sharing—Rubbercraft Corp. of America, Inc., New Haven, Conn., on a bid of $562,456.56 and Breslee Mfg. Co., Inc.,

NEW! *High Strength* **NUT DESIGN**

CUTS SIZE AND WEIGHT OF AIRFRAME COMPONENTS

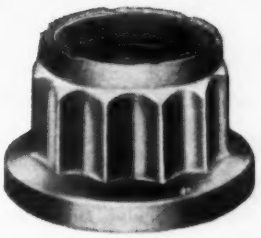


—with the famous Self-Locking Red Elastic Collar that protects permanently against IMPACT! VIBRATION!

The NEW ESNA High Strength-Double Hex Nuts have been scientifically engineered to accomplish distribution of thread load with minimum weight and wrench diameter. They develop 185,000 psi. min. in NAS high strength aircraft bolts, and are completely interchangeable with existing internal wrenching nuts; yet their double hex design permits a weight reduction of 66%, and a height reduction of 50%. The engine mount fittings of the DC-6 shown above clearly illustrate how fitting size can be reduced. Similar design advantages can be gained for such problems as edge distance, nut spacing and flange width. Of great importance maintenance-wise is the fact that no special wrenches are required—any socket wrench will do.

Further—like all Elastic Stop Nuts—the NEW High Strength Nut remains self-locking in both fully seated and positioned settings.

HERE'S A CHALLENGE: Send us complete details of your toughest bolted trouble spot. We'll supply test nuts—FREE, in experimental quantities. Or, if you want further information, write for literature. Elastic Stop Nut Corporation of America, Union, New Jersey. Representatives and Agents are located in many principal cities.



THE RED ELASTIC COLLAR IS VISIBLE EVIDENCE OF LOCKING SECURITY

Threadless and permanently elastic, it provides these 4 outstanding features:

1. **Protects against nuts loosening due to VIBRATION**
2. **Keeps locking threads CORROSION FREE**
3. **Provides for accurate BOLT LOADING**
4. **Seals against LIQUID LEAKAGE along the bolt threads.**

AND IT IS RE-USABLE

ESNA TRADE MARK

ELASTIC STOP NUTS

INTERNAL WRENCHING

ANCHOR

WING

SPLINE

CLINCH

GANG CHANNEL

CAP

PRODUCTS OF: **ELASTIC STOP NUT CORPORATION OF AMERICA**

New York, N. Y., on a bid of $1,387,568.

For 13,311 reflectors (IFB 49-430):
Minnesota Mining & Mfg. Co., St. Paul, Minn., on a bid of $17,836.74.

For 203 voltmeters (IFB 49-431):
General Electric Supply Corp., Dayton, O., on a bid of $1583.40.

For 50 relays (IFB 49-432):
Westinghouse Electric Corp., Dayton, O., on a bid of $1709.50.

For 53 parabolic glass reflectors (IFB 49-433):
Bausch & Lomb Optical Co., Rochester, N. Y., on a bid of $2444.89.

For 48 transformers (IFB 49-434):
Companies sharing—General Electric Co., Dayton, O., on a bid of $294 and Westinghouse Electric Supply Co., Dayton, O., on a bid of $9161.10.

For 25,000 mechanic's tool cases (IFB 49-445):
Simonson Metal Products Co., Chicago, Ill., on a bid of $127,750.

For 2278 temperature indicators (IFB 49-460):
Lewis Engineering Co., Naugatuck, Conn., on a bid of $37,150.42.

For 600 vulcanizer plate assemblies (IFB 49-467):
Companies sharing—Winner Manufacturing & Sales Co., Denver, Colo., on a bid of $6700; Mines Equipment Co., St. Louis, Mo., on a bid of $450, and The B. F. Goodrich Co., Akron, O., on a bid of $1862.

For 1041 lamp assemblies (IFB 49-481):
Art Specialty Co., Chicago, Ill., on a bid of $8119.80.

For 76,000 ball bearing assemblies (IFB 49-189):
Barden Corp., Danbury, Conn., on bid of $100,350.

For 226 radio transmitter assemblies (IFB 49-190):
White Tuning Corp., New York, N. Y., on bid of $177,960.30.

For 66 stand assemblies (IFB 49-210):
Companies sharing—Bardwell & McAlister, Inc., Burbank, Calif., on a bid of $39,990; Aeronca Aircraft Corp., Middletown, Ohio, on a bid of $166,765.92 and Jumbo Steel Products Co., Azuza, Calif., on a bid of $49,990.

For 2594 bank and turn indicators (IFB 49-233):
L. N. Schwien Engineering Co., Los Angeles, Calif., on a bid of $213,787.12.

For 25 gyro type tripods (IFB 49-245):
Fearless Camera Co., Inc., Culver City, Calif., on a bid of $20,625.

For cable, wire (IFB 49-240):
Companies sharing—Phelps Dodge Copper Products Corp., New York, N. Y., on a bid of $58,500; General Cable Corp., Cincinnati, O., on a bid of $372,400; Midway Electric Supply Co., New York, N. Y., on a bid of $2572; United States Rubber Co., New York, N. Y., on a bid of $15,240; Collyer Insulated Wire Co., Pawtucket, R. I., on a bid of 672,000 and Rome Cable Corp., Rome, N. Y., on a bid of $7600.

For 769 projector release controls (IFB 49-206):
Winslow Co., Newark, N. J., on a bid of $17,918.

For 292 mounting plates (IFB 49-264):
Hollenbeck Mfg. Co., Los Angeles, Calif., on a bid of $3182.80

For wiper packing gland rings (IFB 49-302):
Ace Products Co., Toledo, O., on a bid of $36,070.25.

For 575 ball bearings (IFB 49-347):
Marlin-Rockwell Corp., Jamestown, N. Y., on a bid of $31,119.

For 90 instrument current transformers (IFB 49-365):
Westinghouse Electric Corp., Dayton, O., on a bid of $1228.50.

For 40 cabinet and relay assemblies (IFB 49-401):
Joseph Weidenhoff Industries, Algona, Iowa, on a bid of $12,821.20.

For blueprinting services (IFB 49-763):
Companies sharing—Rapid Photo Service, Inc., Springfield, O., on a bid of $125,000; Service Blueprint & Supply Co., Dayton, O., on a bid of $75,000; American Blueprint Co., Hamilton, O., on a bid of $50,000; Dayton Blueprint Co., Dayton, O., on a bid of $100,000 and Ferdwagner Co., Cincinnati, O., on a bid of $100,000.

For adapter, elbow, plug, etc. (IFB 49-144):
Companies sharing — Riverside Screw Products, Dayton, O., on a bid of $7304; The Aircraft Fitting Co., Cleveland, O., on a bid of $15,145; The Deutsch Co., Los Angeles, Calif., on a bid of $2429.44; Schroeder Tool & Engr., Inc., Detroit, Mich., on bid of $2423.60; The Parker Appliance Co., Cleveland, O., on a bid of $1009.50; Roy J. Heyne Machine Co., Phoenix, Ariz., on a bid of $129.60; V. L. Graf Co., New Baltimore, Mich., on a bid of $96; Motor Parts Co., Calhoun City, Miss., on a bid of $648 and Empire Tool Co., Detroit, Mich., on a bid of $820.

For 765 gage, manifold pressure (IFB 49-53):
The Commercial Surplus Sales Co., Baltimore, Md., on a bid of $6885.

For resistors (IFB 49-223):
Companies sharing—Shallcross Mfg. Co., Collingsdale, Pa., on a bid of $2205; Clarostate Mfg. Co., Brooklyn, N. Y., on a bid of $310; Concord Radio Corp., Chicago, Ill., on a bid of $568.50 and Continental Carbon Inc., Cleveland, O., on a bid of $1254.50.

For capacitors (IFB 49-225):
Companies sharing—Sangamo Electric Co., Springfield, Ill., on a bid of $70; Cornell Dubilier Electric Corp., S. Plainfield, N. J., on a bid of $86.22; Girard-Hopkins, Oakland, Calif., on a bid of $714 and Neptune Electronics Co., New York, N. Y., on a bid of $415.

For ammeter, meter, rectifier, etc. (IFB 49-293):
Companies sharing — Stewart-Warner Corp., Chicago, Ill., on a bid of $914; Federal Telephone & Radio Corp., E. Newark, N. J., on a bid of $550 and Bendix Radio Div. of Bendix Aviation Corp., Towson, Md., on a bid of $1200.

For aluminum alloy, sheet, condition T, heat treated (IFB 49-311):
Permanente Products Co., Oakland, Calif., on a bid of $358,812.97.

For aluminum alloy sheet (IFB 408):
Reynolds Metals Co., Louisville, Ky., on a bid of $72,257.99.

For adapter, bushing, cap, etc. (IFB 49-422):
Companies sharing—The Deutsch Co., Los Angeles, Calif., on a bid of $9976.70; Shaw Machine Co., Miamisburg, O., on a bid of $3305; The Aircraft Fitting Co., Cleveland, O., on a bid of $3853.50; Collins Engr. Co., Joe C. Collins, Owner, Culver City, Calif., on a bid of $1312; Rod Cutting Co., Cleveland, O., on a bid of $1872; Ohlson-International Corp., Ohlson-Empire Div., on a bid of $703; Irvin W. Masters, Inc., Burbank, Calif., on a bid of $720; Pacific Piston Ring Co., Los Angeles, Calif., on a bid of $170; and The Parker Appliance Co., Cleveland, O., on a bid of $869.

For terminals (IFB 49-482):
Companies sharing — Graybar Electric Co., Dayton, O., on a bid of $4475.62; Burndy Engr. Co., Inc., Bronx, N. Y., on a bid of $103.20 and Aircraft-Marine Products Inc., Harrisburg, Pa., on a bid of $2335.34.

For 10 grinder and lathe (IFB 49-487):
Barrett Equipment Co., St. Louis, Mo., on a bid of $13,515.05.

For headsets (IFB 49-706):
Telephonics Corp., New York, N. Y., on a bid of $36,861.20.

For tape, for photographic use (IFB 49-651):
The Seamless Rubber Co., New Haven, Conn., on a bid of $3682.96.

For 25,000 ft. of cable (IFB 49-902):
Collyer Insulated Wire Co., Pawtucket, R. I., on a bid of $12,650.

For spare parts (IFB 49-508):
General Motors Corp., United Motors Service Div., Detroit, Mich., on a bid of $43,243.65.

For 32,388 gal. ethyl acetate (IFB 49-424):
Companies sharing—U. S. Industrial Chemicals, Inc., New York, N. Y., on a bid of $23,831.53 and Missouri Solvents & Chemicals Co., St. Louis, Mo., on a bid of $14,400.

For 14,090 lb. of rivets (IFB 49-442):
Companies sharing—Reed & Prince Mfg. Co., Worcester, Mass., on a bid of $707.75 and John Hassall, Inc., Brooklyn, N. Y., on a bid of $11,563.85.

For 22,200 lb. compound lining (IFB 49-491):
Turco Products, Inc., Los Angeles, Calif., on a bid of $1758.24.

For 4573 generator relays (IFB 49-258):
Phaostron Co., South Pasadena, Calif., on a bid of $106,354.15.

For 1125 voltmeters (IFB 49-289):
General Electric Co., Schenectady, N. Y., on a bid of $12,194.72.

For random lengths of aircraft hose (IFB 49-310):
Companies sharing—U. S. Rubber Co., New York, N. Y., on a bid of $125,790.50 and B. F. Goodrich Co., Akron, O., on a bid of $71,430.30.

For 434,176 gal. of acetone (IFB 49-337):
Companies sharing—Davies-Young Soap Co., Dayton, O., on a bid of $73,941.60 and Publicker Industries, Inc., Philadelphia, Pa., on a bid of $207,901.70.

For 60 envelope assemblies (IFB 49-402):
Lee's Incorporated, Indianapolis, Ind., on a bid of $10,020.

For 1000 filters (IFB 49-404):
Revere Electric Mfg. Co., Chicago, Ill., on a bid of $1120.

For 20,000 ratchet type screwdrivers (IFB 49-417):
J. O. Mfg. Co., South Gate, Calif., on a bid of $5400.

For 425,323 lb. of sulphuric acid (IFB 49-423):
Companies sharing—City Chemical Corp., New York, N. Y., on a bid of $3797.29 and Allied Chemical & Dye Co., New York, N. Y., on a bid of $34,369.72.

For 125 bomb-bay fuel tank assemblies (IFB 49-252):
Bardwell & McAlister, Inc., Burbank, Calif., on a bid of $41,250.

For 11,000 heavy flying shoes (IFB 49-116).
Bristol Mfg. Corp., Bristol, R. I., on a bid of $118,250.

For 112 panel board panels (IFB 49-339):
General Electric Co., Dayton, O., on a bid of $6705; Jos. Weidenhoff, Inc., Algona, Iowa, on a bid of $898.05 and General Electric Supply Corp., Dayton, O., on a bid of $5780.32.

For cloth shipping bags (IFB 49-370):
Companies sharing—Thomas Stationery Mfg. Co., Springfield, O., on a bid of $4740; McVeigh Industries, Inc., Detroit, Mich., on a bid of $4510.80 and Roth Office Equipment Co., Dayton, O., on a bid of $108.

For 165,900 lb. of grit steel (IFB 49-449):
Abrasive Shot & Grit Co., Springville, N. Y., on a bid of $9954.

For 2314 pad and parachute assemblies (IFB 49-555):
Companies sharing—Irving Air Chute Co., Inc., Buffalo, N. Y., on a bid of $26,784.30 and Switlik Parachute Co., Trenton, N. J., on a bid of $8073.80.

For 22,600 lb. of chronimum nickel (IFB
Charles Beseler Co., Newark, N. J., on a bid of $9041.50.

For 22,600 lb. of chrouimum nickel (IFB 49-592):
Metal Goods Corp., Houston, Tex., on a bid of $17,442.99.

For 141,000 clamps (IFB 49-492):
Companies sharing—Wittek Mfg. Co., Chicago, Ill., on a bid of $13,668; George K. Garrett Co., Inc., Philadelphia, Pa., on a bid of $955 and Air Associates, Inc., Teterboro, N. J., on a bid of $204.

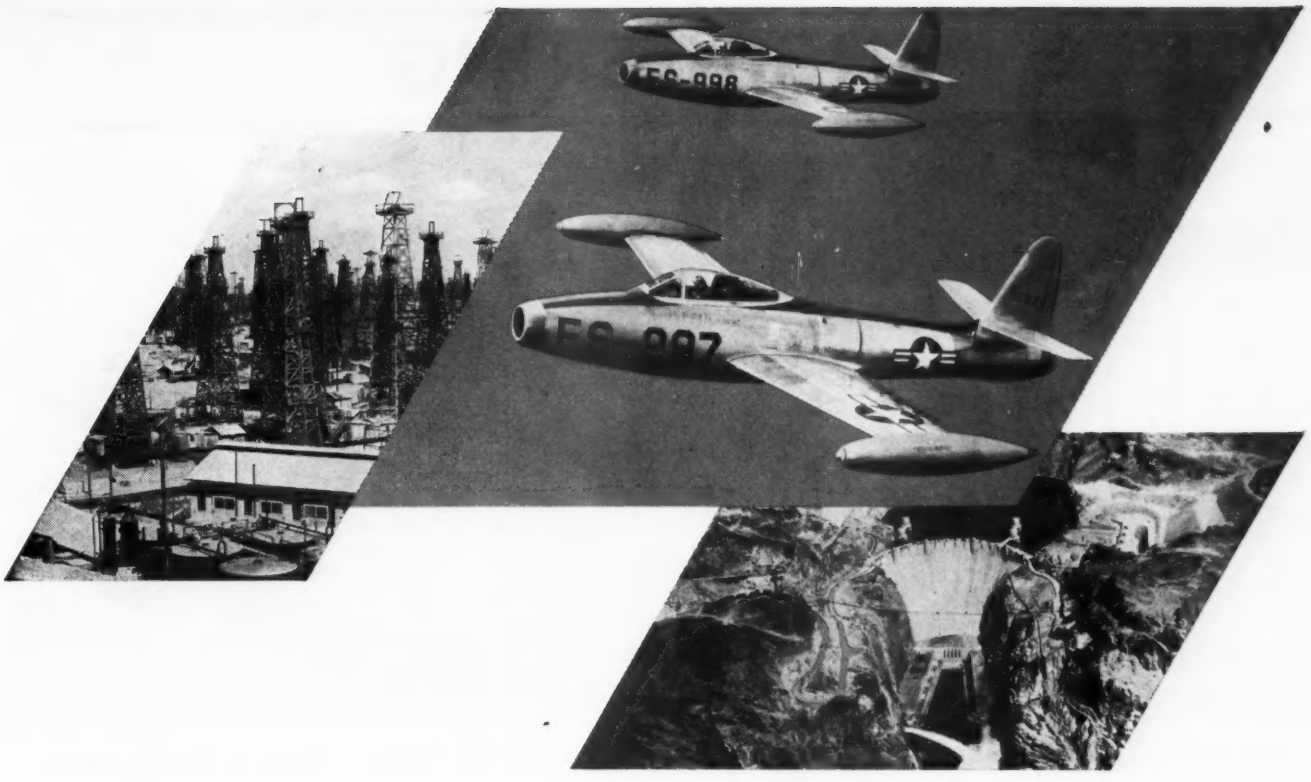
For 12,000 qts. cellulose dope (IFB 49-517):
Andrew Brown Co., Los Angeles, Calif., on a bid of $5751.

For 200 swaging machines (IFB 49-541):
James R. Kearney Corp., St. Louis, Mo., on a bid of $113,000.

For 10,450 lb. thread (IFB 49-544):
W. Warren Thread Works, Inc., New York, N. Y., on a bid of $15,288.35.

For 399 electric tachometer generators (IFB 49-550):
General Electric Co., Schenectady, N. Y., on a bid of $10,565.75.

For 123,119 gal. of anti-icing fluid (IFB 49-572):
Companies sharing—Davies-Young Soap Co., Dayton, O., on a bid of $47,088; McGuire & Co., Emeryville, Calif., on a bid of $33,538.40 and Enjay Co., Inc., New York, N. Y., on a bid of $2,341.11.



THUNDERJETS OVER AMERICA

San Diego, berth place of our alert Pacific fleet . . . Hollywood and Los Angeles, centers of the cinema world . . . and Southern California industry and commerce. ¶ San Francisco, gateway to the Orient . . . and back o'er the San Joaquin's lush acres of nature's generous bounty, with adjacent Ojai Valley . . . concentrated lode of oil for the wheels of progress . . . and great Hoover Dam, man-made miracle of irrigation's wonders, all are assured protection. ¶ This vital area of the West is patrolled by the Air Defense Command of the U.S. Air Force . . . which is calling upon Republic F-84 Thunderjets in ever increasing numbers to assist in carrying out the air defense mission. The Thunderjet's broad range . . . speed of more than 600 M.P.H. and tremendous striking power, are day by day proving to be necessary defense factors . . . for preserving the peace.

Republic Aviation Corporation, Farmingdale, L. I., N. Y.

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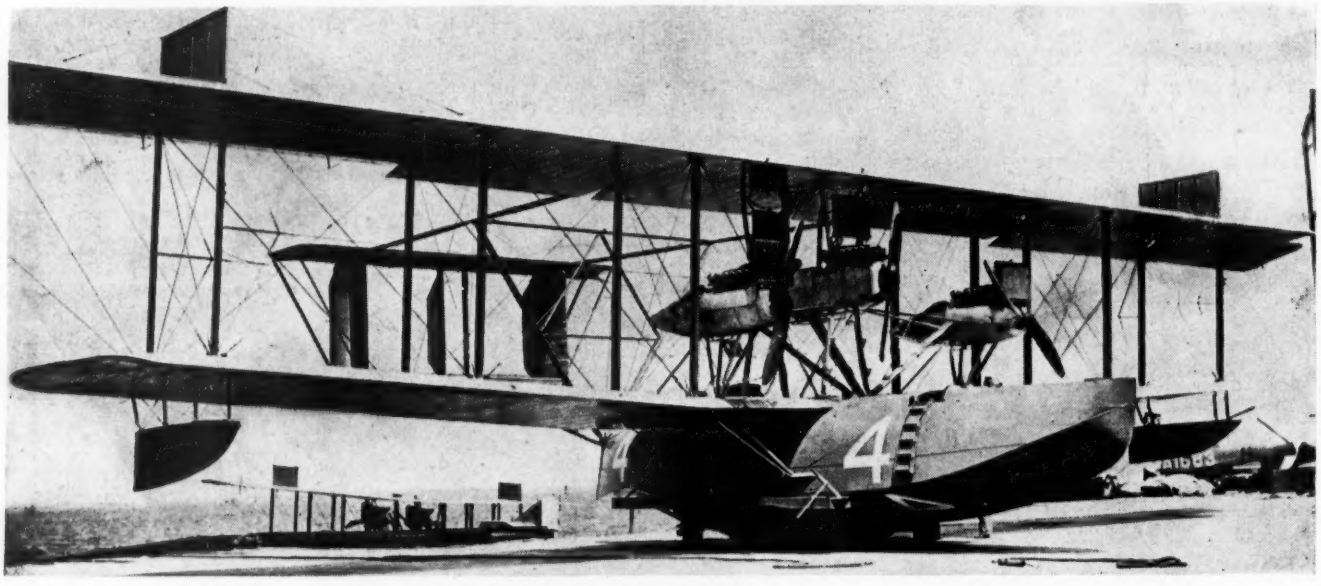


OLD DESIGN: Curtiss NC-4's hull contributed only small part of craft's total drag. Progressive general clean-up led to . . .

Research Review

New Hull Fineness Slashes Drag

Remarkable reduction in form resistance eliminates classic inequality, makes flying boat competitive with landplane.

By Robert McLarren

The age-old controversy between flying boat and landplane enthusiasts has assumed new importance as both military and commercial demands increase for longer range and reduced operating costs.

The modern airplane has been pushed to such limits of efficiency that such formerly minor items as landing gear weight, takeoff run at maximum weight and percentage useful load to gross weight are now predominate design considerations.

It is against a new framework of extremely high power and large size (24,000-hp., 200-ton Hughes flying boat; 21,000-hp., 150-ton Convair B-36 landplane) that comparisons between the flying boat and landplane based on prewar data are no longer valid.

The "slow, awkward" flying boat of prewar days has now been replaced by clean, high-performance designs that are comparable to the in-flight performance of landplanes, while retaining the classic advantage of unlimited surface facilities.

▶**Two Types for Tests**—Research engineers have improved the aerodynamic and hydrodynamic efficiency of flying boats by designing hulls that are longer and slimmer than previous shapes. Length/beam ratio has become an important criterion of the efficiency of a flying boat design.

Two new Navy flying boats feature this improved hull form. The Martin XP5M-1[1] is already flying and will serve as an important laboratory for tests to develop data for use on later (and larger) models.

The Convair XP5Y-1[2] is now nearing completion at San Diego, Calif. and is a full-fledged tactical type intended for long-range sea search and anti-submarine warfare.

▶**Hull Drag Small**—Increasing the length/beam ratio (roughly comparable to the fineness ratio of a streamlined form) as an aid to drag coefficient reduction is not new, and engineers have long known that improved flight performance could result from reduced hull frontal area in proportion to total hull volume.[3]

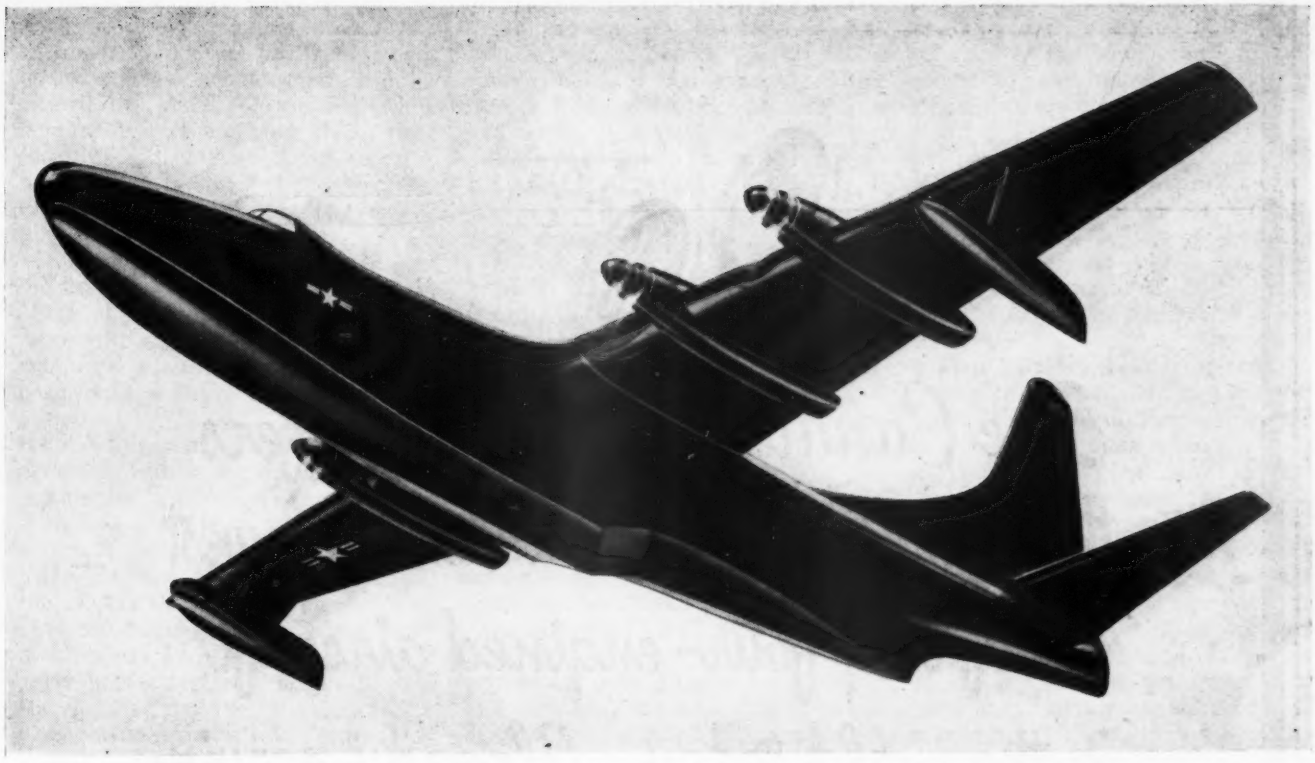
However, it was not until the mid-Thirties that the reduction in total drag afforded through reduction in hull drag began to assume substantial importance.

For example, the drag of the Curtiss NC-4 hull (designed by Holden C. Richardson and Jerome Clark Hunsaker), which was a particularly "clean" design, was only an infinitesimal part of the total drag of wings, radiators, struts, wires, tail surfaces, hull, etc.

▶**Boats Cleaned Up**—As the U. S. Navy flying boat progressed to the sesquiplane design of the Consolidated P2Y, the strut-braced monoplane configuration of the Convair PBY, and the full cantilever design of the Boeing 314, Boeing XPBB and the Convair PB2Y, the flying boat form was "cleaned up" and the drag of the hull became a progressively larger portion of the total drag until it constitutes as high as 25 percent in a recent modern design.[4]

Thus, prior to the mid-Thirties, there was very little practical need for work on hull drag reduction, the major problem being the reduction of drag in the other components of the flying boat.

▶**First Towing Basin**—Another factor that contributed to this inattention was the lack of flying boat hull testing facilities in this country, although Germany, France and Great Britain possessed



. . . NEW DESIGN: Convair XP5Y-1 is clean, slim configuration. Here, lessening of total drag via hull drag reduction becomes important.

model towing basins designed specifically for flying boat hull and seaplane float research. A survey in 1929 by the National Advisory Committee for Aeronautics revealed that the U. S. had only two towing basins, both of which were designed for ship model test work, before the appearance of the seaplane.[5]

It was on the basis of this obvious need that the NACA designed and built the first U. S. seaplane test basin. Construction began in 1930, it was completed the following year, and was dedicated on May 27, 1931.

It was this important research tool that first isolated the various design variables comprising a flying boat hull, and modern flying boat design owes much of its development to the late Starr Truscott, who supervised the work in this basin for many years.

► **Hull-Drag Tested**—Within a period of about five years, work in this NACA high-speed towing basin had developed fundamental criteria for flying boat hull design on the basis of hydrodynamic characteristics, and it was only after this determination of required configuration that ensuing desired data could be developed.

After producing several flying boat hulls possessing required hydrodynamic characteristics had been completed, they were subjected to wind tunnel tests to determine their aerodynamic characteristics. The tests[6] indicated that these hulls had about twice the drag of an equivalent airship form having the same frontal area.

► **Drag Isolated**—These tests (1935) came at a time when the reduction of flying boat component drag had progressed to the point making hull drag a significant part of the total, so that the reduction of hull aerodynamic drag was isolated as an important research and design problem.

Instead of testing various detailed changes in these hydrodynamic shapes, NACA chose a good aerodynamic form and applied to it minimum changes required to adapt it as a satisfactory hydrodynamic form.[7]

A solid of revolution with a fineness ratio of 7.22 and a maximum ordinate at 30 percent of its length was changed into a flying boat hull by the addition of chines, a shallow transverse step and a pointed afterbody.

► **Characteristics Compromised**—Wind tunnel tests of this new hull form (actually two were tested, differing only in detail) revealed that its drag was lower than any previously tested hull shape when compared on the basis of equal volume.

Hydrodynamic tests were not so satisfactory, however, and indicated a "sticking" tendency of the model at certain combinations of trim, speed and load. This effect was created by the rounded cross-sections forward and aft of the step and insufficient depth of step, both of which resulted from holding hydrodynamic compromises of the good aerodynamic form to a minimum.

Thus, the tests indicated that while aerodynamic drag could be reduced sharply by considerations of good streamlined form in hull layout, compromises were necessary if good hydrodynamic characteristics were to be obtained.

These pioneering tests failed to disclose the hidden value of increased length/beam ratio. But it will be noted that the higher fineness ratio form inadvertently produced an increased length/beam ratio over those previously used for model tests.

It was about this same time, however, that W. Sottorf, in Germany, isolated this phenomenon in his work on seaplane floats in the Deutsche Versuchsanstalt fur Luftfahrt (DVL) basin.[8]

► **Program Enlarged**—Results of these NACA tests on two modifications of a streamlined form proved so encouraging, that the program was considerably enlarged to include an entire family of hull forms derived from a solid of revolution with systematic changes in configurations to determine the exact point at which aerodynamic and hydrodynamic efficiencies were at a maximum.[9]

These tests, involving 24 separate hull forms, indicated that the drag of a hull possessing adequate hydrodynamic properties for use on a flying boat need not be more than about 25 percent greater than the basic streamlined form from which it was adapted.

Again, the effect of increased length/beam ratio was hidden in these data.

► **Ratio Isolated**—Finally, in 1943, came the discovery that broke the dam and isolated length/beam ratio as a basic design parameter for high efficiency flying boat hull design. (*Cont. p. 25*)

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NACA researchers Bell, Garrison and Zeck, in an examination of available information on flying boat hull design, discovered that previous tests had increased the length of the hull while holding the beam constant, which, while actually producing an increased ratio, had completely obscured the effect because of the resulting increase in the physical size of the hull.

For this reason, comparative data did not provide an indication of the effect of increasing the length/beam ratio with a given volume but merely compared a small hull with a given beam with a larger hull of the same beam.

► **Ratio Important**—Three models were designed with constant length-beam product but with length/beam ratios of 5.23, 6.54 and 7.84, covering the range of actual hulls then in use. To isolate length/beam ratio as much as possible, the models all used the same angle of dead rise, angle of forebody keel, angle of afterbody keel (and, therefore, the angle between them), height of hull and depth of step.

The hydrodynamic tests[10] proved that increased length/beam ratio gave higher hump speed and lower hump resistance, better takeoff performance and higher permissible load coefficients. (The tests also revealed slightly higher spray at high speeds but this has since been found to vary more directly with length-beam product, which was constant in the tests reported here.)

Thus, for the first time, the independent importance of length/beam ratio was established.

► **Change Not New**—It was at about the same time that these important results were being obtained that one of the humorous coincidences of scientific research was discovered. Fred Locke, noted seaplane expert of the Stevens Institute of Technology (now with the Navy Bureau of Aeronautics) made an analysis[11] of the dimensions, proportions and loadings of about 100 flying boat hulls and seaplane floats of the preceding 25 years and concluded that designers had been steadily increasing hull length/beam ratios all along without knowing why.

By plotting load coefficient against length/beam ratio for these hulls and floats, Locke uncovered the fact that the ratio had increased with the coefficient in the relationship 6.05 times the cube root of the latter.

Actually, however, this gradual increase in length/beam ratio had been made to preserve the hydrodynamic characteristics of the various designs rather than for aerodynamic reasons since a decrease in frontal area by a decrease in the beam results in an increased beam loading, with attendant spray problems.

► **Criterion Obtained**—It was to determine a correlation between hull dimensions and spray characteristics that NACA's John B. Parkinson prepared a study that indicated that the latter were a function of beam loading and hull length/beam ratio.[12]

This investigation developed the relationship.

$$C_{\Delta_o} = 0.0675 \left(\frac{L_f}{b}\right)^2$$

in which $C\Delta_o$, the gross load coefficient, is equal to the gross load divided by 64 times the beam cubed, L_f length of forebody (bow to step), and b is the maximum beam. This important criterion reveals that the load coefficient varies with the square of the forebody length/beam ratio.

► **Maximum Ratio**—Next step in the NACA research program was to determine just how far the length/beam ratio could be increased before adverse characteristics started to appear.

A series of 10 hull models, varying in length/beam ratio from 5.07 to 10.5 was tested in the Langley towing basin and these trials indicated that there did exist maximum length/beam ratios for each general type of hull beyond which the load/resistance ratio begins to decrease.[13]

Thus, the range of useful length/beam ratios was effectively bracketed and the test program could now be concentrated within this range for more effective study.

► **Sea Ranger Tested**—As part of a general wartime investigation of the Boeing XPBB-1 flying boat, NACA investigated an extensive series of systematic changes in hull form on a model of the plane.

With a length/beam ratio of 9.9, the revised model showed the following improvements—reduced hump resistance and trim, and the range of stable c.g. positions remained unchanged.[14] However, the tests showed that the range of stable trims was less than that obtained for models with conventional length/beam ratios.

► **Spray Probed**—Trials of this XPBB model were continued with the length/beam ratio changed to 9 to determine whether earlier indications of satisfactory spray characteristics[15] were applicable to this particular configuration.[16]

These tests confirmed the earlier results but again indicated a limit in the length/beam increases by revealing unsatisfactory spray characteristics at a gross-load coefficient above approximately 2.3.

However, an important conclusion of these tests was that the high length/beam ratio would make possible a reduction in hull size without adverse effects on the spray characteristics.

► **Drag Reduction**—Having thus determined satisfactory hydrodynamic characteristics of flying boats whose length/beam ratio is increased while holding the product of beam and the square of the length constant, NACA next returned to the wind tunnel to determine the exact improvement in aerodynamic drag afforded by this variation.[16]

These vital tests proved conclusively that an increase in length/beam ratio from 6 to 15 reduced the minimum drag coefficient 29 percent, a truly remarkable discovery and one establishing definitely the superior aerodynamic characteristics of high length/beam ratio hulls.

► **Tests Continued**—Ensuing tests have alternated between wind tunnel and the towing basin in further development and checking of these important results.

As a further check on the earlier limitation of maximum length/beam ratio, trials were conducted on a modified model of the XPBB-1 with a length/beam ratio of 15, an extremely long, narrow hull, yet even with this exceptionally high ratio the water resistance and takeoff time and distance of the model were approximately the same as for a conventional design with a ratio of 6[17].

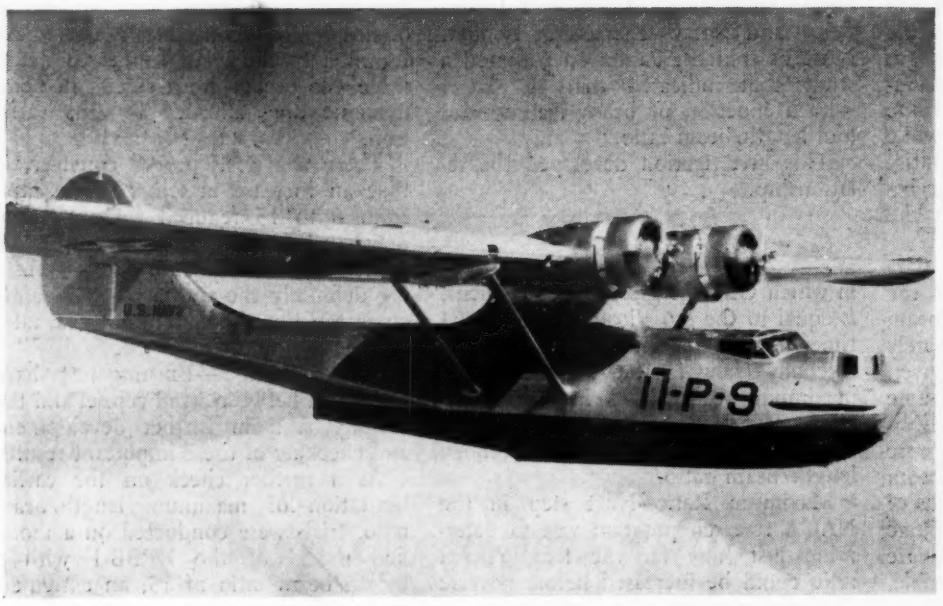
The spray characteristics were acceptable and a practicable range of position of c.g. was available for takeoff.

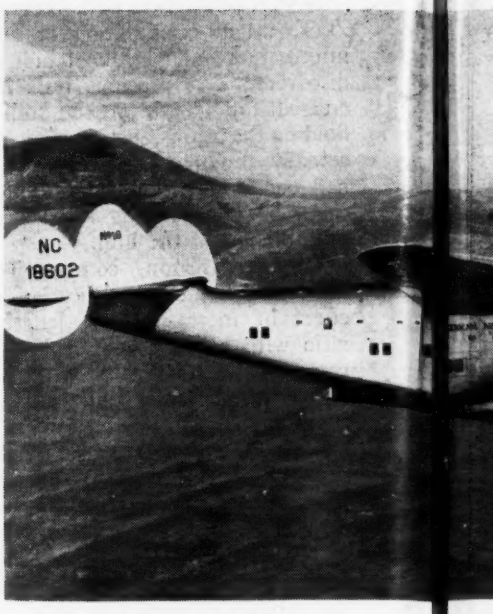
A more detailed investigation of the spray characteristics of this model, with length/beam ratio varying from 6 to 15 indicated that designers may go to these high length/beam ratios without any fear of penalizing spray characteristics.[18] These latter tests actually indicated that higher loads may be used on the high length/beam ratio hulls than on conventional ratio hulls without danger of propeller spray, thereby indicating that the spray criterion of the equation as stated on this page, is actually conservative.

► **Changes Permissible**—Additional tests of these models were made to determine the effect of such changes as depth of step, angle of afterbody keel and length of afterbody on a high length/beam ratio hull. It was indicated that not only does the high length/beam ratio hull possess superior aerodynamic advantages without important compromises to hydrodynamic characteristics, but that the effect of variations in configuration is about the same on a hull with a ratio of 9 as on a hull with a ratio of 6.[19]

► **Further Drag Reductions**—Having determined the basic advantage of higher length/beam ratio hulls, NACA conducted a series of tests to determine what further reductions in aerodynamic drag could be made by simple "clean up" of the angles and corners of the hull form.

This was an approach to the problem directly opposite to the original; whereas a streamlined body of revolution was slowly modified to produce a satisfac-





Flying boat design progressions. Left: Convair PBY-1. Center: Boeing 314. Right: Model of Boeing XPBB-1 (underside view) used by NACA f

tory hull, these tests took the successful hull and made progressive modifications in the general direction of the body of revolution.[20]

These studies revealed that the use of a more pointed bow with a chine faired to conform more closely to the direction of airflow at the bow could reduce the drag 9 percent.

The use of a shallow transverse step in combination with an auxiliary longitudinal step, believed to be hydrodynamically practical, reduced the drag 14 percent.

Rounding the forebody and afterbody chines provided a drag decrease of 18 percent.

Taken together, the elimination of all sharp chines, the step, and the discontinuity caused by the forebody chine flare, reduced the drag of the hull about 30 percent over its original form.

These data pointed clearly towards the gains to be made by the use of retractable chines and steps, features now being incorporated on the Convair "Skate" turbojet-powered combat flying boat.[21]

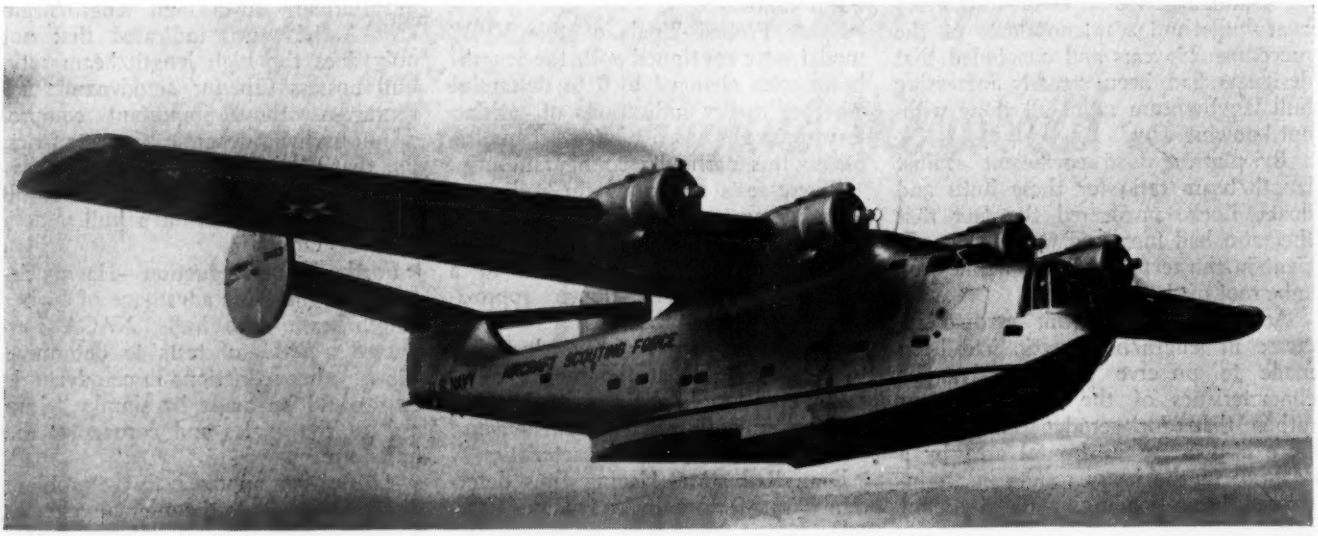
▶ **Swept Wing Readied**—To prepare the way for really high-speed flying boats using thin, swept-wings, NACA conducted a further test of high length/beam ratio hulls to determine the effect of wing-hull interference.[22]

Since all of the earlier tests were made with full or stub wings of about 21 percent thickness mounted on the hull, it was apparent that these data might not be directly applicable to the design of flying boats using wings of only 10-12 percent thickness. Trials showed that the elimination of the wing interference factor had little or no effect on the variation of minimum drag coefficient or longitudinal stability with increasing length/beam ratio, preparing the way for high Mach number designs.

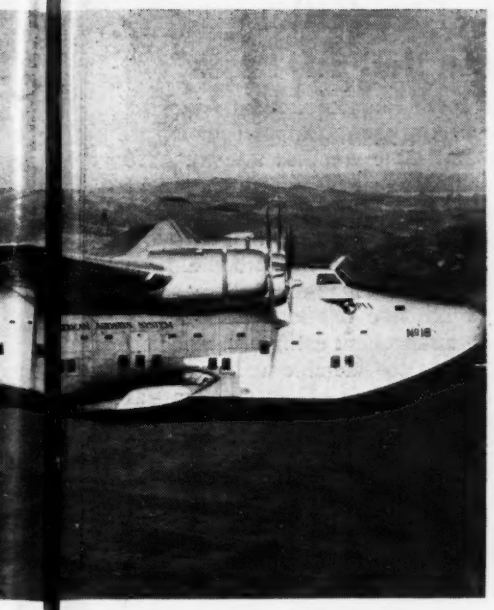
▶ **Boats Now Competitive**—Thus, after an 18-yr. period of flying boat hull basic research, 10 of which have been spent in a definitive program examining the merits of increased length/beam ratios in decreasing aerodynamic drag and improving hydrodynamic characteristics of flying boat hulls, NACA has developed a complete range of design data through the use of which the designer can realize vastly improved flying boat performance.

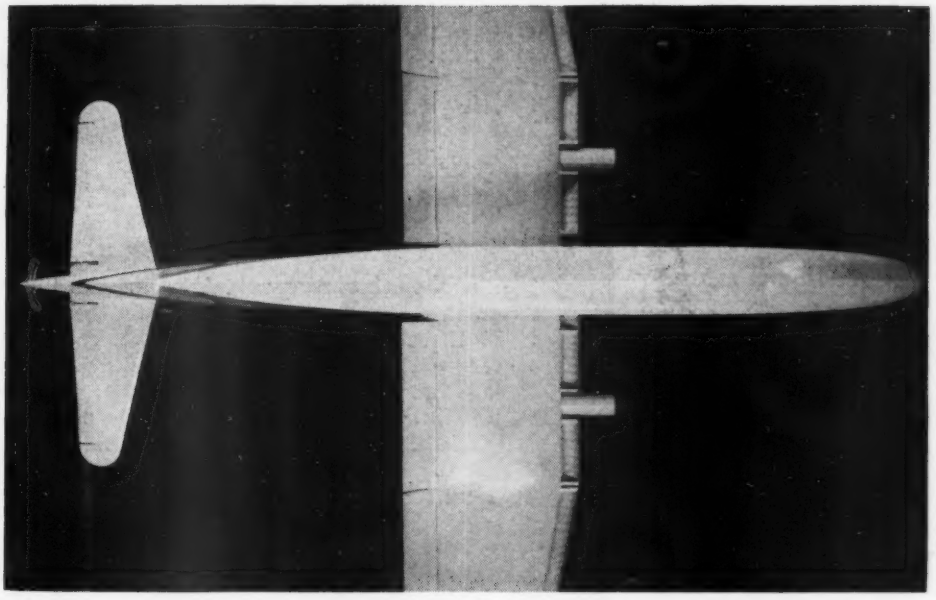
The practical value of this body of research data is seen in the fact that if the length/beam ratio of a given hull be doubled, the range of the resulting flying boat can be improved 20 percent; this without sacrifice in hull volume (for stowage, crew quarters, etc.) and with an improvement in takeoff distance and takeoff time.[22]

Assuredly, this program can have



Clean-up is also evident in this Convair XPB2Y-1 flying boat.





ased b CA for series of tests of varying length/beam ratio. Configuration had ratio of 11.2 but model was checked over range from 6 to 15.

vital importance to the military and commercial operation of long-range aircraft and placed the flying boat on a par with the landplane for the first time in the former's 28-yr. history.

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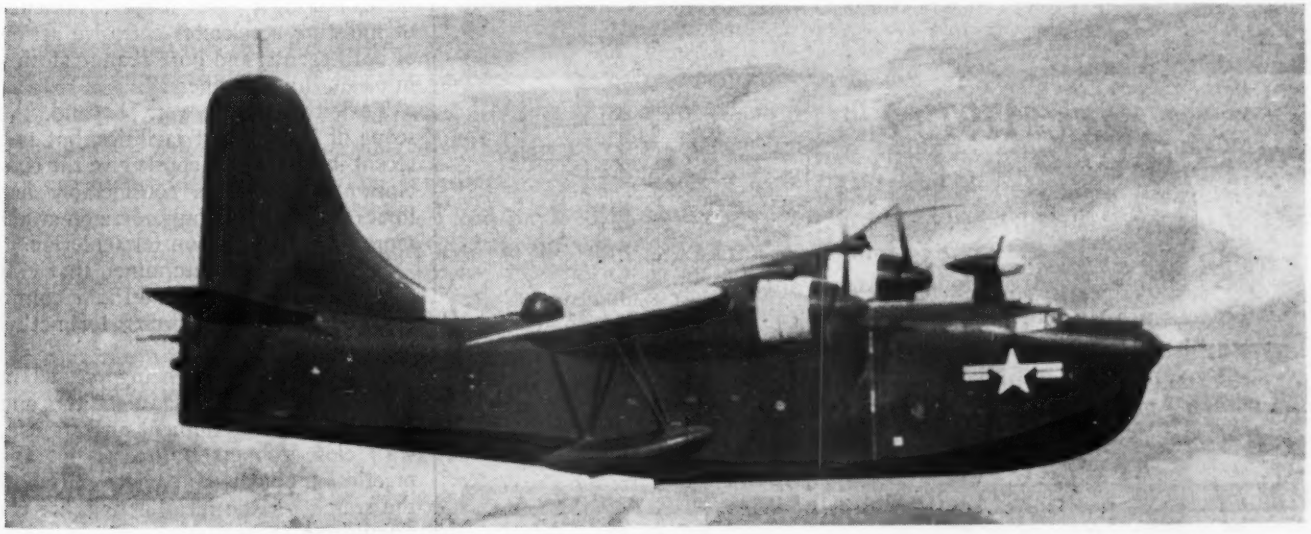

Martin XP5M-1 features improved hull form. Craft will serve for hull studies.

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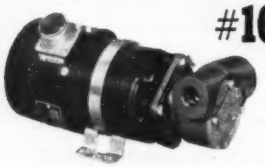

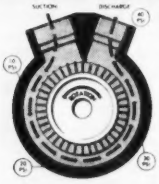

Typical turbine pump assembly.

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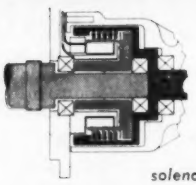

Schematic showing operation of solenoid-operated clutch.

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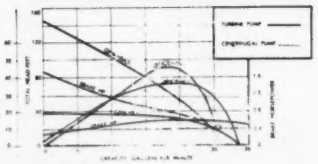

Characteristic curves for centrifugal and turbine pumps.

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New Fire-Killer Evaluated In Tests

More exacting requirements for fire extinguishing agents, imposed by larger, faster and more complex aircraft, have accelerated research and development in this field since the war's end.

It has become apparent that adequate fire protection employing carbon dioxide involves an undesirable weight penalty. Methyl bromide has long been recognized as an excellent extinguishing agent and permits considerable weight savings over comparable CO_2 installations—as much as 250 lb. or more in total system weight on large planes.

▶ **Research Instituted**—However, methyl bromide is highly toxic and corrosive. It was these characteristics that led Walter Kidde & Co., Belleville, N. J., pioneer manufacturers of aircraft fire extinguishing systems, to conduct research for a fire-killer that would match the efficiency of methyl bromide but not have that agent's corrosive and toxic properties.

Data obtained in extensive tests, run on a surplus B-26 engine set-up and on an engine accessory section mockup, indicate that as an immediate possibility for an improved fire extinguishing agent, the German-developed C-B seems the most likely choice. As manufactured in this country, C-B is practically pure monochloromonobromomethane.

▶ **New Agent's Properties**—It has been found that C-B has fire-killing power equal to that of methyl bromide when used in aircraft engine extinguishing systems.

Because C-B has a higher specific gravity, approximately 11 to 12 percent more of this medium than methyl bromide can be stored in a container of given volume.

C-B has been found to be less corrosive than methyl bromide. It attacks all materials attacked by methyl bromide, but to a lesser degree. Presence of moisture accelerates corrosive action of both agents, and both require storing in clean, dry containers.

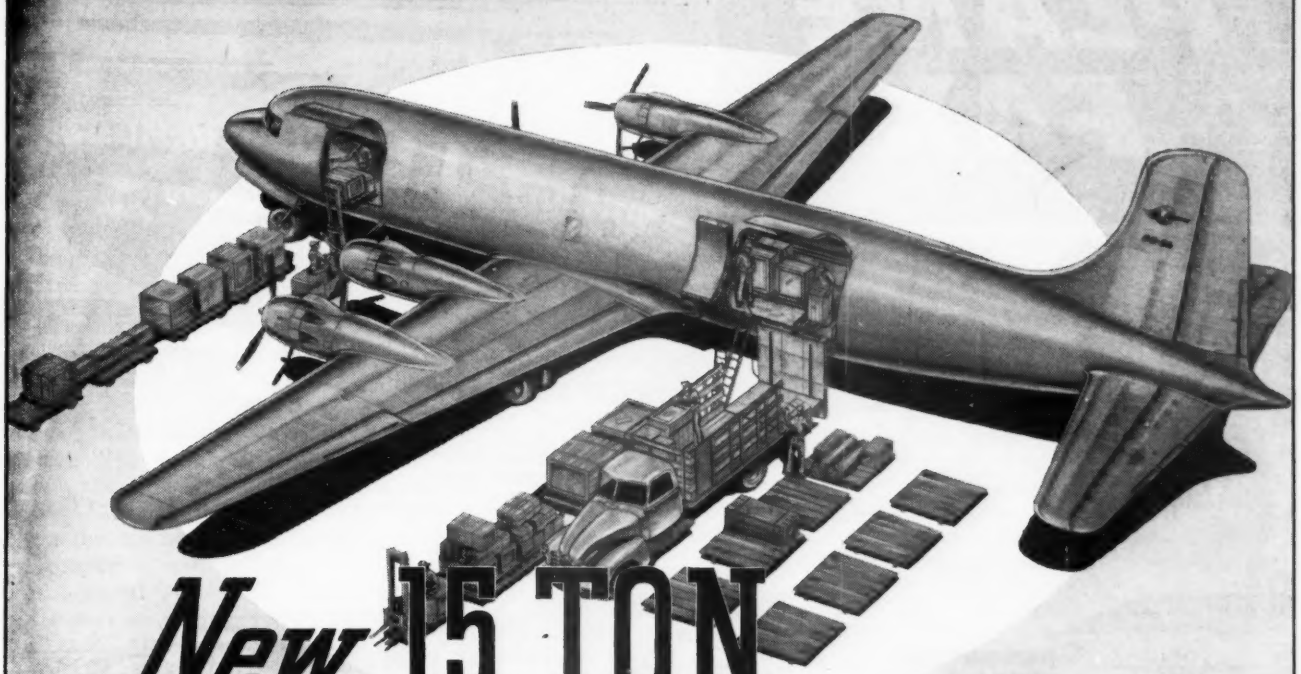
Toxicity studies were beyond the scope of Kidde's test facilities, but two recent independent reports give the conclusion that C-B is considerably less toxic than methyl bromide, somewhat more toxic than carbon tetrachloride.

It has also been determined that C-B can be used with the same Kidde equipment as now used on aircraft for methyl bromide.

Further research is being pushed in the hope that plane manufacturers and fire protection equipment makers can, with close cooperation, work out the practical problems still to be solved in the search for the ideal aircraft fire extinguishing agent.

One detail, still requiring some work,

DOUGLAS DC-6A



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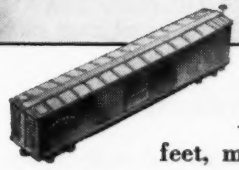

A usable volume of 5,000 cubic feet, more capacity than the largest boxcar... a swift powered platform for easy loading... a cruising speed of 300 miles per hour—these features and many more point up the new Douglas DC-6A Air Freighter—sister ship of the giant Douglas DC-6 passenger transport.

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Large doors at each end of the DC-6A cabin afford maximum versatility in loading operations, since both loading and unloading can be performed simultaneously. Also, the DC-6A incorporates a highly efficient cabin pressurizing and air conditioning system which permits full use of high altitude flight with no danger to perishable freight. Temperatures are held constant by thermostatic control whether plane is flying or on the ground.

Thus the outstanding performance of this new air freighter will make available to the military services a cargo transport capable of supplying world-wide bases and military operations of unprecedented scope.

As the new Douglas DC-6A takes to the air it will carry on the great record of the famed Douglas C-54, which completed more than 80,000 crossings of the Atlantic and Pacific during World War II and has made possible operation of the Berlin air lift.

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A page of service tips for private flyers and fixed-base operators

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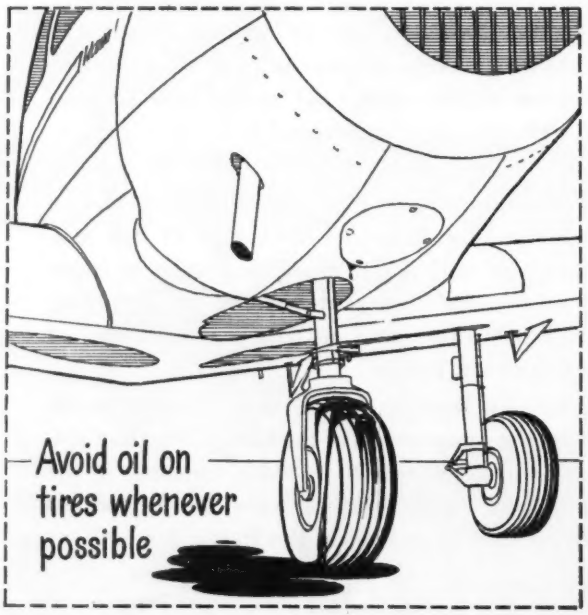
J. P. Nystrom, Superintendent of Maintenance of Palo Alto Airport, Inc., tells how "RPM" helps cut down expensive overhauls. He reports that "since the first fiscal year, after switching to RPM Aviation Oil, we have flown approximately 13,000 hours with absolutely no stuck valves, rings or bearing failures."

Now, of course, Palo Alto Airport uses RPM Aviation Oil exclusively in its company-owned flight line ships. And Mr. Nystrom recommends "RPM" Oils to his customers because "it gives us a deep feeling of satisfaction to be able to use and recommend a product knowing that it will give the type of service to which the aviation public is entitled."



"We take better care of your plane"

How parking care extends tire life

If a wheel of your plane, when parked, is directly below the engine, it's a good idea to cover it to keep engine drippings off the tire. Some careful flyers have inexpensive tire covers made for this purpose. Protect your tires from damage by oil—and use Atlas Aircraft Tires for rugged, dependable service. For these famous tires have an extra "safety factor" and durability, thanks to special Atlas engineering which produced the best for military planes. Your Standard Airport Dealer can supply you with Atlas Aircraft Tires now.

bears heavily on the overall fire extinguishing problem. This is improved compartmentation of airframes, to confine the extinguishing agent to spaces of fire hazard and away from passengers and crew.

Tool Planning Brings Production Economies

Production costs at the Glenn L. Martin Co. are minimized through advance work-analysis by the company's master tool planning group.

When a new plane is to be produced, the master tool planner starts with the contract bid and injects his ideas into the engineers earliest thinking on the project. He maintains close contact with the engineering department throughout the various design stages to insure that the aircraft will be adaptable to economical construction.

In a report by John S. Mason, general supervisor of the master planning unit at Martin, it is pointed out that changes in production tooling not only are required to produce a new model aircraft, but also when a new contract calls for the same airplane at a different rate and quantity.

Mason emphasized that parts often can be produced more economically by hand although on the surface it would appear that the use of machine tools would be advisable. The number of parts to be produced usually determines which method is best.

As an example of economy achieved by proper tooling methods, Mason cited the case of a large access door in an early stage of design on a new contract.

The planner recognized a difficult forming operation involved in producing a one-piece coaming. He had the choice of forming it in one piece by hand, or in four pieces with simple tooling–but with an increase in assembly cost. Also, if in one piece, the job could be done with expensive forming tools.

His analysis determined at what quantities each of these methods would become economical. A compromise resulted with the decision to use the one-piece, hand-formed coaming on the experimental model, with a change to the four piece coaming on the anticipated production contract. This quantity was not great enough to justify expensive forming tools.

Mason pointed out that economical production features are designed into an airplane, not through the preconceived ideas of production tooling as applied in other industries, but on tooling accurately applied to the exact conditions peculiar to each new contract

FOR YOUR CONVENIENCE...A COMPLETE

SHERWIN-WILLIAMS COLOR LINE!

19 carefully selected colors—plus black and white—in the complete Sherwin-Williams Aircraft Color Line! And all of them are available in four types of finish: Opex Pigmented Nitrate Dope, Opex Pigmented Butyrate Dope, Opex High Gloss Lacquer, Kem Synthetic High Gloss Enamel.

Offering color matches for most aircraft manufacturers' standards, the colors in the Sherwin-Williams line have been chosen for their purity, richness, cleanness, brilliance . . . and outstanding durability. Pigments are pure struck colors, free from any tinting (except where hue is lightened by addition of white).

In addition to this comprehensive color line, Sherwin-Williams offers other finishes for every aircraft and airport requirement. The Sherwin-Williams Co., Aircraft Division, Cleveland 1, Ohio. (Export Division, Newark, New Jersey).

Products of Sherwin-Williams Industrial Research

SHERWIN-WILLIAMS
AIRCRAFT FINISHES

NEW AVIATION PRODUCTS

Anti-Icing Glass

Trans-Atlantic operators test effectiveness of current-heated windshield.

Two international airlines, one American and one foreign, have been testing the newly developed Nesa anti-icing windshield made by the Pittsburg Plate Glass Co.

The panels are made up of two laminated sheets of glass sandwiching a layer of plastic to afford strength, with a thin coating of Nesa material capable of conducting an electric current between the two terminal strips embedded in either end of the windshield.

Resistance to the current impressed across the panel causes it to heat sufficiently to melt away any ice accretion on its outer surface.

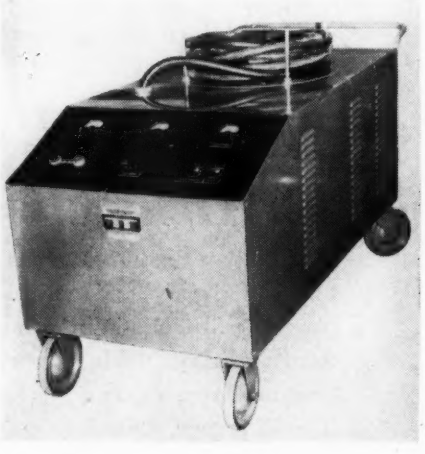
Tests have been conducted during the past few months on scheduled operations over the North Atlantic. Aside from one distorted panel and a burned out voltage booster, the trials have been satisfactory. Frequently, extremely severe icing conditions have been encountered, but in all cases the windshields were kept clear.

Trans-Atlantic airlines are experiencing practically no trouble with this installation. But at least one domestic carrier has experienced difficulties—usually cracked glass and delamination.

Several of the large airframe manufacturers are currently conducting exhaustive tests of the Nesa panel to determine whether it is the final answer to the vexing problem of windshield icing.—G.C.

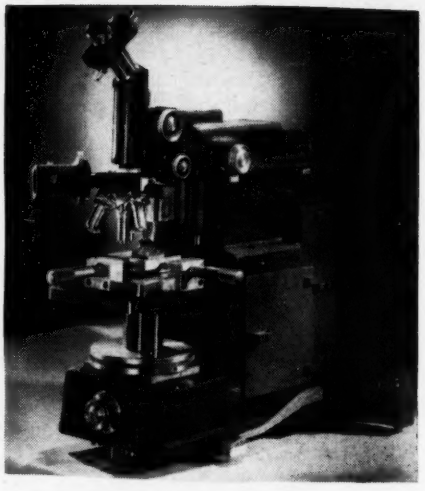
Jet, Missile Insulation

Thermoflex insulation blanket for jet aircraft and guided missile use, developed by **Johns-Manville**, 22 E. 40th St., New York, 16, N. Y., is designed for application to jet tailpipes, exhaust cones, turbine casings; valves, pumps, reservoirs or fuel lines in hot zones; cabin air heating or anti-icing system heat exchangers; and for protection of structure and fuel storage areas in guided missiles. Thicknesses begin at ½ in. and weight can be as low as 0.30 lb./sq. ft. Protection against fire hazard from absorption of fuel, lubricating oil or hydraulic fluid is provided by fully sealing the asbestos felts in seam-welded .002-in. Inconel or stainless steel foils. Inner (hot side) of blanket is grooved to give flexibility and permit conformance to curved surfaces. Outer (cold side) is smooth, continuous surface of seam-welded sheets protected by fine mesh screen of Monel metal against wear normally incurred during periodic inspection and maintenance procedures.



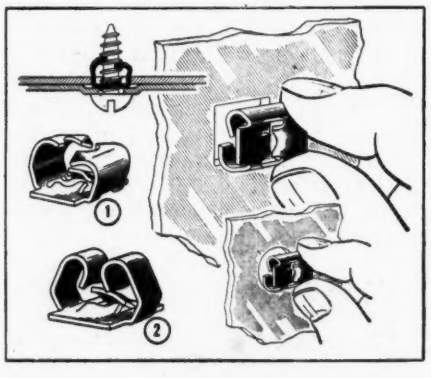
Facilitates Electrical Checking

Portable tester, Model PA 916, made by **Pacific Airmotive Corp.**, 2940 N. Hollywood Way, Burbank, Calif., is triple purpose unit serving for aircraft electrical trouble shooting, engine starting, and heavy-duty battery charging. It may also be used as d.c. power source for radio service and accessory test purposes. Power can be supplied to the plane through regular external power connection, or through generator supply connection at firewall electrical coupling. Device is provided with rheostat voltage control giving adjustment of charging current for batteries. It can handle relatively large number of batteries, since it has continuous rating of 200 amp. at 28.3v. d.c. Low over-all height facilitates movement around hangar and under airplanes. Optional model is equipped with gasoline engine instead of electric motor drive.



Micro Hardness Tester

New tester announced by **Kent Cliff Laboratories**, Peekskill, New York, applies dead weight load as light as 1 gram with either Knoop or Vickers type indenter for micro hardness checking of minute particles, inclusions, constituents, thin metals, transition zones of welds, wire, foil, ceramics, glass, and plastics. Device is bench type instrument, hand-operated to eliminate vibration. Adjustable oil dash-pot, for controlling speed of load application and time of load retention, is adjusted easily to suit specific testing requirements. Mechanical stage, consisting of stationary plate, transfer plate and specimen block, provides convenient means for positively positioning exact area of test specimen beneath indenter and scope.

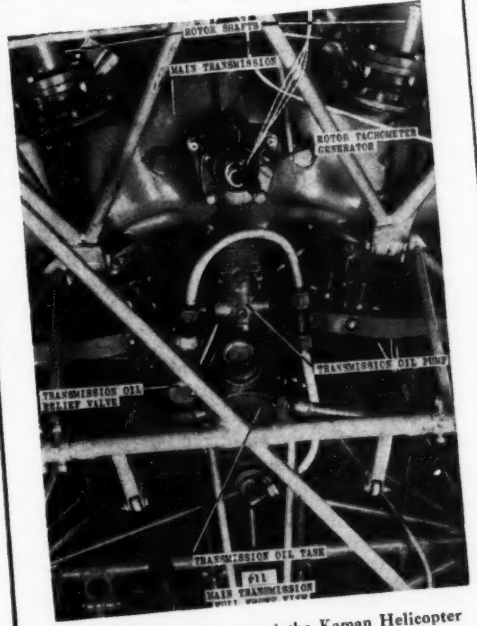


Quick-Action Fasteners

For fast blind assembly of parts to metal panels, new expansion Speed Nuts are offered by **Tinnerman Products, Inc.**, 2035 Fulton Rd., Cleveland 3, Ohio. Units are inserted into square or round holes and part to be attached is placed in position and the screw driven. Nuts are self-retaining and expand when tapping screw is inserted. Two basic designs are offered—with spring arms formed to grip at root of screw thread, and with arms turned under to "ride" on thread crest.

This industrial helicopter has seating capacity for pilot and two passengers, has useful load of 800 lbs. Driven by a 190 hp Lycoming engine, its range is about 235 miles, top speed 95 mph., cruising speed 70 mph.

"The newest thing in Helicopters"



Designers and engineers of the Kaman Helicopter chose SHELBY Tubing because they know they can depend on it. The finest tubing produced for aircraft applications, SHELBY Seamless is made to exacting Government specifications, is available in a complete range of sizes, and in the current alloy steels.

. . . attains maximum strength and lightness with SHELBY Aircraft Tubing

THE new Kaman Utility Helicopter, the K-190, which successfully passed its structural tests last year, is now in production for commercial uses.

This "definitely different" machine is unique in its use of dual, intermeshing rotors, and in the mounting of a pilot-controlled servo flap on the rotor blade which gives the craft pronounced stability and instantaneous control response.

Designed to be used as a piece of industrial and agricultural equipment, the K-190 features dependability of operation, sturdiness of construction, and easy accessibility for maintenance. These desirable properties are ensured largely by the use of SHELBY Seamless Aircraft Tubing throughout — in the rotor shafts, landing gear, fuselage and controls. All tubing is SAE X4130, chrome molybdenum steel. Approximately 110 individual SHELBY Tubes are welded to form the basic fuselage structure.

It is because SHELBY Seamless Tubing keeps weight to the very minimum and yet insures the utmost in ruggedness and shock-absorbing qualities that designers have for years used it in aircraft of every type and every size. With no other form of construction can you build so strong, so light, and so durable as with seamless steel tubing.

The uniformity and dimensional accuracy of SHELBY Seamless Tubing—its ability to bend and shape to almost any form desired — its easy welding properties that permit complicated joints and junctions with 100% efficiency, combine to help you achieve the utmost in structural efficiency. Our engineers will gladly assist you in applying U·S·S SHELBY Tubing to your designs.

WALLS WITHOUT WELDS

NATIONAL TUBE COMPANY, PITTSBURGH, PA.
(Tubing Specialties Division)
COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

SHELBY *Seamless* AIRCRAFT TUBING

FINANCIAL

Dividends Bolster Aircraft Shares

Recent disbursement actions of Douglas and other key manufacturers seen as improving investment status.

Surprise action of Douglas Aircraft Co. recently in declaring a quarterly and special dividend resulted in an immediate favorable reaction to the company itself as well as improving the investment status of the industry as a whole.

The uncertain and sporadic dividend record of the aircraft builders often has been viewed by investors as a major manifestation of lack of stability in the industry. Current Douglas action tends to refute this contention and may encourage other aircraft companies to follow the same course.

The aircraft industry, essentially a contracting business, does not have the regularity of operations common to most standard enterprises whose cash flows and profits can be measured almost uniformly throughout the year. For this reason, aircraft manufacturers for the most part, even when operating at profitable levels, preferred to wait upon the completion of the year's results before taking any dividend action.

Moreover, the aircraft industry unfortunately has had too many peaks and valleys to institute a policy of regular disbursements to stockholders.

▶**Tangible Mementos**—Many of the old-line industrial corporations deliberately pursue a course of making regular quarterly dividend payments as a form of good stockholder relations. One of the most satisfactory means of keeping the scattered ownership interests content is to send them tangible mementos of the company's progress at regular intervals.

Stockholder relations in the aircraft industry have deteriorated with a well-publicized uprising attempt last year in one instance.

While there has been no evidence of any stockholder threat or criticism of consequence directed at the Douglas management, such disbursements as the company's recent voluntary dividend action can not but help obtain favorable regard for the company leadership.

▶**Past Policy**—From the time it inaugurated dividend payments, Douglas previously followed the course of making such disbursements toward the close of its fiscal period and on an annual basis. The first payment was 88 cents a share paid in 1932. Upon the resumption of dividends, $3 per share was paid in 1938 with a similar amount disbursed the following year.

Beginning with 1940 and continuing through 1945, $5 per share was paid annually. In 1946, after the declaration of what was expected as the usual $5 year-end payment, another disbursement of $2.50 was paid a few months later. This was offset when the 1947 payment was reduced to $2.50 per share.

In the last quarter of 1948, the usual $5 per share again was paid, leaving the assumption that disbursements for that year were completed.

The current action of declaring a quarterly payment of $1.25 and a special of $2.75 therefore represents a radical departure from past policies. The implication is quite clear that in the future, dividend payments will be on a regular quarterly schedule.

▶**Higher Profits?**—Moreover, the special $2.75 payment lends credence to the belief that earnings for the fiscal year ended Nov. 30, 1948, were much larger than previously anticipated. When the 1948 dividend payment was declared, the management indicated that such disbursement about equaled earnings.

The current special dividend payment would indicate that net earnings for the past fiscal year amounted to at least $4,650,000 or $7.75 per share on the 600,000 shares presently outstanding. Reported earnings for the first nine months of last year came to but $3.25 per share, which implies that adjustments in the fourth quarter resulted in a material boost in final results.

Despite its relative liberal dividend payments, Douglas continues in a healthy financial condition with a book value of about $125 per share, net current assets alone bring estimated to exceed the current market price of around $60 per share.

▶**Semi-Annual Payments**—Many aircraft companies pursue a policy of making semi-annual disbursements, when such payments are possible.

Grumman Aircraft has shown a tendency to follow the twice-yearly payment method, but generally on a surprise basis. Nevertheless, Grumman enjoys the best record in the aircraft industry from the standpoint of consistency in earnings and dividend payments.

During the entire 18 years of its existence, Grumman has earned a profit in every year and has paid dividends in all annual periods. This is a unique record in the aircraft industry and would be noteworthy in any other industrial group as well.

Moreover, the record shows that once Grumman raised its dividend rate, it has never been cut. In June, 1948, the company declared a 100 percent stock dividend which increased total common shares outstanding to 1 million. Based on the new stock issued, payments amounted to $2 per share last year and, as adjusted, were equivalent to $1.50 for 1947, $1 for 1946 and 75 cents annually for the preceding periods going back through 1941. Final earnings for 1948 amounted to $2.39 per share.

With the company's backlog continuing at around $150 million, there is reason to believe that earnings for 1949 may at least attain 1948 levels. The company recently paid a semi-annual dividend of one dollar per share for 1949, much earlier in the year than had been anticipated.

▶**C-W**—With recent changes, top management of Curtiss-Wright may be expected to experience considerable more stability in direction and policy. The company has had to contend with a difficult capital structure problem in relation to its current level of business.

An estimated net working capital in excess of $100 million has made the company subject to various pressures for special disbursements or reduction of its capitalization. In any event, in addition to the usual $2 per share annual dividend to be paid on a quarterly basis on the 953,719 shares of Class "A" stock, a $1 per share disbursement was declared for the 7,432,039 shares of common now outstanding. A call has also been made for tenders on a limited number of common shares.

▶**Stability Returning**—Recent contract awards and re-allocations of orders resulting from the 1950 budget have fairly well determined the immediate outlook for most of the separate aircraft builders. On this premise, the respective managements should be in an improved position to gauge their immediate outlook. With this uncertainty removed, a major factors no longer exists as a reason to withhold or delay cash disbursements to stockholders where such course is both possible and desirable.

The Douglas action in starting a quarterly dividend policy should set an excellent example in promoting goodwill among stockholders for those aircraft builders who heretofore have made disbursements on an irregular year-end pattern.

—Selig Altschul

Buenos Aires Letter

U. S. Lines Strong in Argentina

Braniff believed aiming at rich market now shared by PAA and Panagra as national lines languish.

BUENOS AIRES—The air transport picture in Latin America continues to be a healthy one as far as the U. S. airlines, Pan American and Panagra, are concerned. Some of the foreign airlines, however, are having their troubles.

Pan American and Panagra report generally good passenger loads with the new "sleeperettes" and "sleeper" planes reserved in advanced in most cases. Pan American has also begun a "coach" service to Buenos Aires from New York at a $120 saving.

▶**FAMA's N. Y. Service**—The Argentine international airline, FAMA, which suffered heavy losses last year on its routes to Europe, has still not come forward with plans for a New York service although six DC-6s are now in Buenos Aires ready to go.

Generally speaking, the national lines of the South American republics have had pretty rough going and several of them have had to curtail their services considerably. This does not include such successful domestic lines as Zonda, in Argentina, or Avianca, in Colombia.

The third U. S. airline to move into Latin America—Braniff—has announced its plans to extend its run from Lima, Peru, across the Andes to LaPaz, Bolivia, and thence across the wide expanses of Brazil to Rio de Janiero, the new terminal point. The report states Braniff is spending $200,000 on new radio and emergency landing facilities, having failed to make arrangements with Panagra for use of theirs.

▶**Scenic Trip**—Braniff will be able to offer a very scenic trip to Rio with its hop over the Andes and across the jungles of Brazil. LaPaz, its midway point from Lima to Rio, is the highest capital city in the world with an elevation of some 13,397 ft.

Braniff is believed to be still aiming at securing permission to fly into Buenos Aires, the natural terminal point in South America. If Braniff hopes to break into the Latin American field in a big way, it will find it can only do so by getting a share of the fairly constant commercial business existing between the largest city of South America and the large cities of North America.

As matters now stand, the annex to the Argentine-U. S. air agreement containing routes and frequency is still to be drawn. The original agreement was signed over two years ago. But until FAMA gets ready to fly regularly to New York, Argentina probably won't be willing to discuss routes and frequencies.

When they do, the Braniff desires to fly into Buenos Aires will certainly be a number one topic for discussion. And Pan American won't have any such influence over the Argentine government as it is said to have had in other cases. But Argentina is unlikely to prove overly generous in handing out routes and frequencies to carriers of another country.

▶**Ticket Ruling**—Pan American and Panagra, together with the big passenger steamship companies connecting the United States and Argentina, have had to place a strange ruling in effect in Buenos Aires in regards to ticket sales.

The new ruling is that no tickets will be sold to anyone who is not a resident of Argentina. That means that if a wandering American journalist or businessman goes into the Pan American office and tries to buy a ticket to New York, he will be refused.

▶**Too Many Pesos**—Reason for the ruling is that Pan American and the others have apparently became caught with an unusually large amount of Argentine pesos which, until recently, the Argentine government converted for them at the official rate. The government, bothered by a desperate dollar shortage, no longer is providing such a currency exchange, so the airlines have had to try to force ticket sales in other currencies. It would be illegal for them to demand dollar payment in Argentina—so they just refuse to sell to people who could pay in other currencies in other countries.

Python-Powered Lancaster

LONDON—An experimental Lancaster aircraft fitted with two Armstrong Siddeley Python gas turbine propeller engines in the outboard positions has made its first test flight.

The Armstrong Siddeley Python is one of the world's largest gas turbine propeller engines and makes an interesting comparison with the 1750 hp. Rolls-Royce Merlin engines also used.

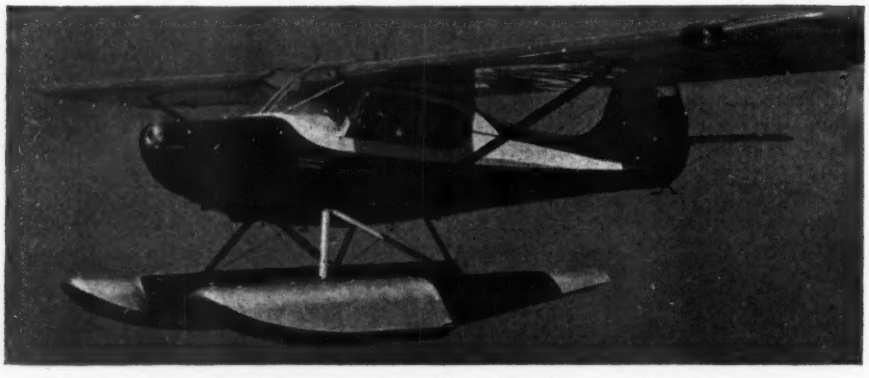
Designed for aircraft cruising at altitudes of 30,000 ft. and at speeds between 300 and 450 mph. the Python propeller turbine with a power output of 3670 s.h.p. plus 1150 lb. thrust, a total of 4110 e.s.h.p. is one of the world's most powerful aero engines.

▶**Engine Modified**—Much development work has taken place since the Python first ran and passed its acceptance test early in 1945. The design of the Python is based on principles which have become associated with Armstrong Siddeley gas turbines. The placing of the air intakes well back from the spinner of the contra-rotating propellers has most efficiently solved the problems of handling the large volumes of air which the engine consumes.

Either an annular air intake or intakes ducted from the leading edge of the wings are envisaged, and data for the alternative installations are as follows:

	Annular Cowl Installation
Max. dia. over engine cowl	54.5 in.
Length mounting flange to center line of rear propeller	85 in.
Overall length	156 in.
Net dry weight	3150 lb.
Estimated installed weight (including propeller)	4100 lb.

Newly styled 1949 Aeronca Sedan.



Lowest cost four-place floatplane.

Diversified Output Aids Aeronca

Non-aircraft items help lightplane builder weather market slump; military contracts total $1.5 million.

By Alexander McSurely

MIDDLETOWN, Ohio—Aggressive search for diversified products to supplement the current meager demand for personal aircraft is paying off for Aeronca Aircraft Corp. As a result Aeronca has made long strides on the road to financial recovery.

The Middletown plane builder hustled into civilian lightplane production at the end of World War II and was one of the two largest producers of such aircraft during the boom year of 1946.

Aeronca reached a peak production at one time of over 1000 planes a month, and built 7555 planes that year.

▶ **Big Inventory**—Rapid slump in lightplane sales which followed caught Aeronca with huge inventories of tubing, fabric and other components, some of which are still being used up.

Aeronca's cash position worsened rapidly, as lightplane sales dropped. In 1947 Aeronca sold 1218 planes, and in 1948 sales were further reduced to 599.

Aeronca was not alone in the sales shrinkage; it was part of a general trend in which personal plane sales for all companies reached an all-time peak of 33,254 planes in 1946, and dropped successively to 15,338 in 1947, and 7039 planes in 1948.

Election in 1947 of John Lawler, former comptroller of the Curtiss-Wright Corp. Airplane division at Buffalo, as president of Aeronca, came about the time the company had reached a new low point in income and cash reserves. Lawler ruthlessly chopped payrolls and beat the bushes for new business to supplement the lightplane business.

▶ **Air Force Business**—Only 20 miles away from Air materiel command headquarters at Wright Field, Lawler was in a strategic position to get Air Force business. When two AVIATION WEEK editors visited him at Middletown last week, Lawler reported Aeronca had a total of approximately $1.5 million in military contracts on the books, and expected to get at least as much more new business this year.

"We are still an airplane company but we have a plant to keep full of production, and an obligation to stockholders to meet," Lawler points out. "By getting these non-aircraft contracts we can keep our employes, technical staff and plant in business until the lightplane picture improves."

▶ **1949 Line**—Aeronca's 1949 airplane line includes the four-place Aeronca Sedan with Continental C-145 engine, the Aeronca Champion tandem trainer, with 85 or 90 hp. Continental engines optional, and the side-by-side two-placer Chief with 85 hp. Continental.

Bill Runyon, Aeronca assistant sales manager, piloted Bob Wood, editor of AVIATION WEEK, and the writer, down from Dayton to Middletown in a 1949 Aeronca Sedan, and then back to Dayton in a 1948 Sedan affording a chance to compare the relatively few changes which have been made.

New interior fittings and upholstery have been restyled into a quite attractive cabin. The Sedan's all-metal wing is painted this year, and the overall paint job is restyled.

▶ **$300 More**—Priced at $4695 flyaway Middletown, the 1949 Sedan costs $300 more than the 1948 four-placer. Other flyaway prices: Champion, $2545 for 90 hp. version and $2495 for 85 hp. version; Chief, $2585.

As of approximately Mar. 1, Aeronca had a backlog of 62 firm orders for planes, including 43 Sedans. They are being produced at the rate of two a day with plans to step up the rate to three a day in April and four to five a day in May, if the expected demand materializes.

With its present production line Aeronca estimates that it could build as many as eight planes a day.

▶ **Sales Prospects**—President Lawler says if Aeronca sells 500 Sedans this year he will be pleased. Runyon is more optimistic, as might be expected from the sales department, and estimates sales of approximately 700 sedans and about 300 two-placers. In 1948 Sedans sales totalled 306, just over half the total Aeronca sales. It is pointed out that the Sedan was late in getting into production last year and that the 1948 Sedans have won many friends.

As the lowest priced four-place floatplane, the Sedan has a good potential in the floatplane market, since it has shown acceptable performance and is approximately $3000 under the Piper-Stinson floatplane, its nearest four-place competitor.

It is estimated that approximately 25 percent of Aeronca Sedan sales made in 1949 will be floatplanes.

▶ **Firm Orders Only**—Lawler has the airplane sales on a cash-on-the-barrel-

head basis, building planes as firm orders and deposits come in.

The company now has 33 distributors, and approximately 1400 dealers. The number of distributors has been sharply cut, and Aeronca expects the distributors to drop off a considerable number of the less active dealers. Lawler compares last year's sales with number of dealers, as an indication that too many of the dealers are non-producers, and feels that a larger territory for each dealer might work out to mean an increase in dealer activity.

He has no immediate plan to change the Sedan materially from its present form, except for minor changes, feeling that a stabilized production on the existing model will result in production economies that will be an advantage for the company and to be reflected in the airplane.

Some of the major Aeronca non-airplane business: Contract for approximately $750,000 for ground rocket launchers with the Ordnance Department; maintenance stands for Boeing B-50s, amounting to approximately $250,000; and smaller contracts for aircraft loading steps, a gun charger unit, and bomb shackles. The Middletown plant was trying hard for a new USAF contract for a ground power unit to start jet fighters, which would probably be the largest single chunk of government business it has obtained.

New Committee

Appointment of a coordinating committee on agricultural use of aircraft for California is being arranged by the California Aeronautics Commission at request of aviation, manufacturing and agricultural groups interested in this development. Committee will include representatives of aircraft manufacturers, flight operators, farmers, chemical manufacturers, etc.

Arkansas Farm Planes

About 200 planes have been licensed in Arkansas for fertilizing, seeding and dusting crops, Granville L. Moore, Arkansas coordinator of the Civil Aeronautics Administration, reports. They will be used extensively on farms except in January, February and December.

Advantages of planes in dusting, as seen by Arkansas farmers, include ability to operate when the ground is too wet for vehicles, and rapid coverage of crops, which often is urgent.

Most of the planes are converted Stearman trainers, but lighter planes will be used by some operators. One Texas operator is bringing 23 planes into the state. These aircraft will be used for crop dusting.

BRIEFING FOR DEALERS & DISTRIBUTORS

AIRLIFT JUNIOR GRADE—Washington State Aviation Assn. has planned a lightplane airlift for relief work in case of a repetition of last year's disastrous Columbia River floods. Snow in the mountains is heavier than last year, and a sudden thaw could precipitate a flood even worse than last year, it is reported.

More than 300 planes, two-place and four-place, owned by the fixed base operators are expected to be on call. Lists of available planes and pilots, including ambulance planes, are compiled, and communities which could be isolated by floods have been asked to pick sites for high ground emergency airstrips.

Lightplanes flew hundreds of hours of rescue and supply missions in the 1948 flood, mostly uncoordinated. The 1949 preparations are expected to make possible much greater efficiency if needed.

INDUSTRY BEECH TWINS—Beech Aircraft Corp. has made available to its dealers an analysis of firms owning postwar twin-engine Beechcrafts showing some 46 different types of business users ranging from advertising companies to wholesalers of food and dry goods. Biggest concentration of the twin Beech planes is found in the petroleum industry, which owns 104 of the executive transports, scattered among 90 firms.

Other major business users: construction and contractor companies, 19 firms using 20 planes; air freight and charter companies, 13 firms using 20 planes; individuals, 12 utilizing 12 planes; lumber and building supplies, 12 firms using 13 planes; machinery manufacturers, 11 firms using 11 planes; machinery parts manufacturers, 10 firms using 10 planes; milling and textiles, 9 firms using 10 planes; publishing companies, 7 firms and 7 planes.

CROP SPRAYING REGULATION—George Childress, CAA industrial operations chief, told a recent conference on aerial agricultural spraying at Kansas State College, Manhattan, Kan., that national regulation of crop-spraying activities from an aviation standpoint was not as practical as control over the ground and aerial applicators by state departments of agriculture, together with an educational program teaching proper means of application.

Any national regulation would run into the problem of widely varying sectional requirements, Childress said. He warned about legal responsibility facing the operators for harmful effects of spraying to adjacent crops, and pointed out that judgments have already been entered against operators for such damages.

BONANZA STATION WAGON—Moving in on the utility plane market is the relatively unknown station wagon version of the Beech Bonanza, which has mahogany panelled cabin, quick removable rear seat, cargo tiedown straps and rings, special hinges on the passenger door which opens forward flat against the fuselage, and special ambulance litter arrangement.

Station wagon version is designed to carry two persons and 440 lb. of cargo, or one person and 335 lb. cargo with a range of 750 mi., or can be used as a regular four-placer.

MAITLAND TO MICHIGAN—Col. Lester J. Maitland has resigned his post as Wisconsin aeronautics director to accept a similar post in Michigan. Maitland takes the spot vacated last fall by resignation of Col. Floyd Evans.

Since Evans left Michigan, Cass Hough, chairman of the aeronautics commission has been doubling as aeronautics director. Maitland's decision to leave Wisconsin was probably influenced by the failure of the state government to support him in his projected airport development program. He had asked for a $3 million two-year state airport program to match federal funds, but this was cut to a token fund of $500,000 by the governor, shortly before Maitland's resignation.

Maitland is probably best known for his part in the Bird of Paradise 1927 flight to Honolulu from San Francisco, in company with another Air Corps lieutenant, Albert Hegenberger, now a USAF major general.

—ALEXANDER McSURELY

AIR TRANSPORT

PAA Studying Super Skycoaches

Juan Trippe discloses plans for world-wide tourist class service at Stratocruiser christening in Washington.

Pan American Airways President Juan Trippe is counting on his fleet of 20 new double-deck Boeing Stratocruisers to speed the day when world-wide tourist-class air transportation can be offered at fares one-third or more below regular rates.

Speaking in Washington at the christening of the first Stratocruiser delivered to PAA, Trippe declared that it is not only an obligation but a matter of "good business" for international carriers to promote mass air travel. He said the Stratocruisers will increase the seat capacity of Pan American's overseas fleet by 40 percent; and then, for the first time, sufficient equipment will be available to provide low cost tourist class service to Europe, the Orient and South America.

▶ **Foreign Permission Necessary**—"There is no reason why a tourist-class air trip to Europe this fall should cost more than $225 ($405 roundtrip)," according to the PAA president. "That is our objective, and we will achieve it if the foreign governments concerned permit. We are very hopeful that they will give us permission."

Current first-class New York-London rate is $630 roundtrip, although a special 30-day excursion fare of $466.70 has been in effect this winter to promote off-season travel.

Trippe did not state specifically that PAA's $1.5 million Stratocruisers, which now accommodate 75 passengers, would be used as super skycoaches. But company officials have said that the carrier's newest and largest equipment is being considered for this type operation.

▶ **Skycoach Success Cited**—Since last September, Pan American has been running 63-passenger DC-4 skycoaches between New York and Puerto Rico. And this month the carrier inaugurated tourist class service from New York to Rio de Janeiro and Buenos Aires with 52-passenger DC-4s.

PAA's passenger traffic between Puerto Rico and New York has tripled since institution of the skycoach operation. "The people want tourist class air service, and it is here to stay," Trippe emphasized.

▶ **Seating Arrangement Variable**—Kenneth C. Gordon, Boeing's chief sales engineer, states that the 71-ton Stratocruiser can be used strictly as an economy-travel medium by removing all berthable seats. Triple chairs can be placed along one side of the cabin where double seats are now installed. "Thus the same plane that will handle the carriage trade in berths and compartments can be converted readily to a skycoach carrying up to 114 passengers at minimum fares," Gordon declared.

An "overseas" type of high-density Stratocruiser loading is already used by the Military Air Transport Service. The YC-97B utilizes double seats and alternating triple seats to accommodate 85 passengers.

▶ **IATA Study Made**—A committee of the International Air Transport Assn. has been studying the whole tourist-class fare picture and will make recommendations this spring. The group was formed after a number of international carriers expressed support for coach service at IATA's annual conference in Bermuda last fall (AVIATION WEEK, Dec. 6). Earliest date IATA-approved tourist fares could become effective is Oct. 1.

PAA's first Stratocruiser flew from San Francisco to Washington for the christening ceremony in 6 hr., 22 min., at an average speed of 388 mph. Shortly afterwards, a second Pan American Stratocruiser made the trip in 6 hr., 12 min.

▶ **Hawaii Service Soon**—Target date for inauguration of regular West Coast-Honolulu Stratocruiser service has been set for Apr. 1, according to PAA officials. A proving run on the Hawaii route was made early this month.

60,000 TON MILES IN ONE LUMP

Perhaps not a record shipment, but large enough to call into use a full-sized overhead crane was this 10,000-lb. ship rudderstock recently loaded aboard a Seaboard & Western Airlines' DC-4 at New York International Airport. The largest unit shipment yet flown from New York International, the rudderstock was carried 12,000 miles to Singapore for installation in a disabled oil tanker. The tanker's operator calculated that it was losing from $2,000 to $3,000 a day while the ship was idle, and that air shipment of the rudderstock saved from $112,000 to $118,000.

NAL Offers Stock To PAA and Grace

In a series of surprise actions, National Airlines has moved to strengthen its financial and operating positions.

The initial financial move was to sell W. R. Grace & Co., 174,000 shares of National stock at $5.50 per share, approximating current book value. A few days later, in the course of the current Civil Aeronautics Board probe on the company's route structure, it was revealed that 346,000 shares each have been offered for sale to W. R. Grace &

Co. and to Pan American Airways.

It is presumed that the initial 174,000 shares acquired by the Grace interests were included in the allocation of 346,000 shares, the balance of 172,000 probably remaining under option. No conclusive details have been revealed on method of acquisition and price to be paid by Pan American.

▶ **Capitalization Increase**—National Airlines now has but one million shares of $1 par value stock authorized and 749,937 shares actually issued. President G. T. Baker was last reported as owning about 168,000 shares of the outstanding stock. It is evident that the issuance of the total 692,000 shares of stock contemplated will require an increase in the authorized capitalization. The sale and issuance of the initial 174,000 shares to Grace, however, was beset by no limitation of the authorized capital structure.

It is obvious that the combined 692,000 shares to be owned by Grace and Pan American interests would amount to about 48 percent of the revised capital stock as compared with only less than 12 percent to be owned by Baker.

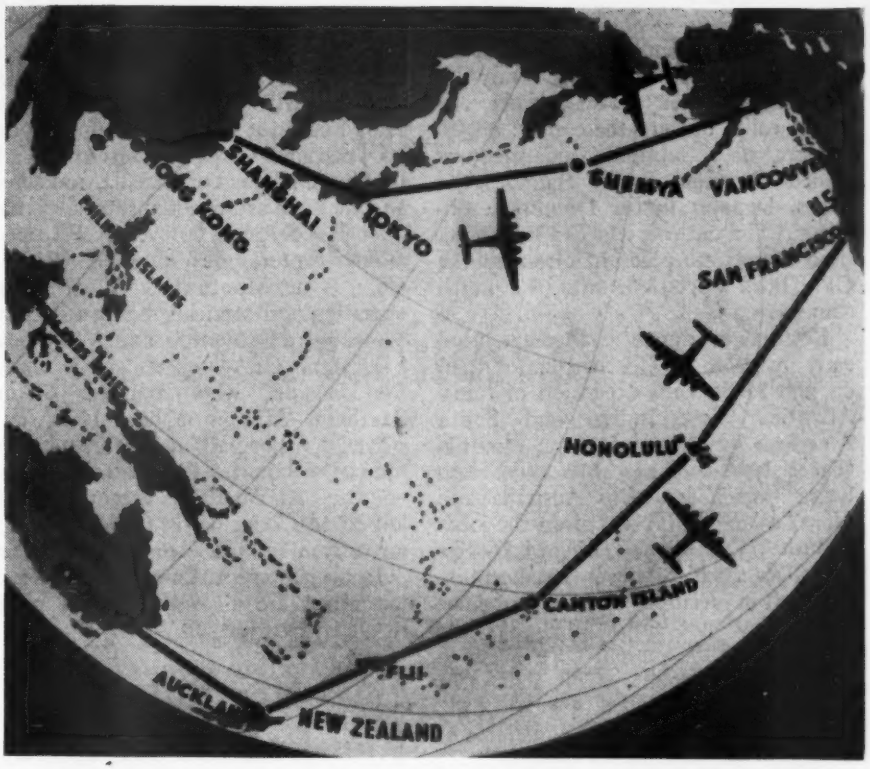
▶ **Hurdles**—Important hurdles remain before the proposed stock purchases can be implemented. A primary consideration will be a determination to be made by CAB whether effective control exists on the part of the new interests. Another question is the possible conflict, if any, that may exist because W. R. Grace & Co. and Pan American jointly own Pan American-Grace Airways.

In recent years, there has been a divergence of views on Panagra by its two owners. Grace has espoused a direct entry through the Miami gateway for Panagra over the vehement objections of Pan American. A compromise on this issue was resolved by an equipment interchange agreement between Panagra and Pan American Airways.

Should the present capital shifts into National be approved, that carrier's finances will receive an important transfusion. Based on the indicated book value, almost $4 million in new funds would be received by National.

▶ **Competitive Effects**—Of greater consequence, National would acquire potent assistance in traffic diverted over its lines from its new stockholders at the New York and Miami gateways. This could place it in an improved competitive position in relation to Eastern Airlines.

Completely unrelated to the financial moves, was the separate equipment interchange agreement National and Eastern filed with the Board. Under this proposal, the two carriers would operate under a through equipment arrangement over National's lines east of New Orleans and over Eastern's route west of that point.



Canadian Pacific Air Lines is rapidly completing plans for activation of over 15,000 miles of new routes to Japan, China, New Zealand and Australia, shown above.

Canada: CPA Pushes Westward

Canada's transportation giant, Canadian Pacific Railways, is mobilizing its far-flung resources preparatory to entering the international aviation business by activating more than 15,000 miles of strategic air routes in the Pacific Ocean area.

Early this spring, Canadian Pacific Air Lines, subsidiary of the sprawling Canadian Pacific Railway empire, expects to begin familiarization flights over its link to the Orient. By summer, CPA wants to have both of its Pacific routes in operation, one extending 6555 miles from Vancouver to Tokyo, Shanghai and Hong Kong via the Aleutian Islands; the second running 8899 miles from Vancouver to Sydney, Australia, and Auckland, New Zealand, via San Francisco, Honolulu, Canton Island and Fiji.

▶ **Surface Operations**—Canadian Pacific Railway, parent company of CPA, describes itself as "the world's greatest travel system." It not only operates a transcontinental railroad, ocean liners on Atlantic and Pacific routes and round-the-world cruises but also a chain of hotels in Canada and nationwide telegraph and express facilities.

Canadian Pacific Air Lines does not operate transcontinentally. But its links extend from the U. S. border to the bush country far north of the Arctic Circle.

For its familiarization flights on the trans-Pacific routes, CPA is leasing two Canadair "North Star" aircraft from the Royal Canadian Air Force. The carrier expects to take delivery late this spring on four pressurized Canadair Fours ordered from Canadair, Ltd., Montreal. These planes will carry 38 passengers and will be powered with four Rolls-Royce Merlin engines.

▶ **Government Policy Changes**—Entry of CPA into the international air transport field is the result of a change in Canadian government policy. During the war, the Canadian government announced a "chosen instrument" policy

CPA President Grant McConachie

for all transcontinental and international services originated in Canada. Only the government-owned Trans-Canada Air Lines would operate these runs.

CPA, as a subsidiary of privately-owned Canadian Pacific Railway, the largest taxpayer in the Dominion, objected. The outlook was bad, and for a time there were plans to break up the CPA bush operations into the north country.

But the government changed its mind early in 1948. TCA had more than enough to do with expansion of trans-Atlantic, West Indian and South American services, and it was essential that a trans-Pacific service come into being from Canada to Australia and New Zealand. CPA was given the job.

▶**Bush Operations Acquired**—The Canadian Pacific Railway has been interested in aviation off and on since 1919. But not until 1933 did the formation of the present CPA begin to take shape. That year, CPR acquired a large share of Canadian Airways, Ltd., then the Dominion's largest operator of northern and western air services.

Since 1933, CPR has been taking over small airlines, mostly operating in northern Canada, where cut-throat competition for the profitable freight business had brought about chaotic conditions. By 1942, CPR had acquired practically all the air services in Canada except TCA and two small airlines. CPA was formed in 1942, and the various airlines making up the system were modernized as much as possible during the war years.

CPA's services to small fur posts and mining areas in the Arctic Circle country run on schedule as do its interurban routes in eastern and western Canada. Its routes do not connect to form a transcontinental service, a privilege enjoyed only by TCA. But CPA operates charter freight flights as well as its scheduled service.

▶**Passenger Traffic Up**—Last year, CPA carried 145,891 passengers, 7,309,633 lb. of goods, and 1,882,034 lb. of airmail. In 1947, 124,720 passengers were flown by CPA, 10,817,971 lb. of cargo and 1,889,085 lb. of airmail.

The drop in cargo carried was not unexpected. In 1947, CPA did a major job of hauling in equipment for the new iron ore mines in Labrador. This work is now being handled by the mining company's own fleet of aircraft.

▶**Equipment Changes**—When CPA took over, the various airlines, it acquired 77 aircraft of every type from Junkers to Lockheed 14s. Today CPA has 47 aircraft on its 9770 miles of licensed domestic routes. These include 17 DC-3s, 13 of which are equipped to carry 28 passengers, nine Lockheed Lodestars, six war surplus Ansons, five Lockheed Hudsons, four Consolidated PBY-5A amphibians, four Noorduyn Norsemans, and two Barkley-Grows. To these will be added the four Canadair Fours for trans-Pacific operations.

▶**Operations Centers Scattered**—With activity in all parts of Canada, and some outside, such as the aerial surveying contract in Venezuela last year, CPA operations centers are scattered. Home office is at Montreal, with divisional operating and servicing headquarters at Vancouver, Edmonton and Winnipeg.

Heading CPA as president is Grant McConachie, who founded Yukon Southern Airways about 1930 and played a major part in developing commercial aviation in the Alaska Highway country. R. W. Ryan, executive assistant to McConachie, is a World War I air veteran and pioneered in commercial aviation in western Canada. Divisional executives are all veteran bush pilots or transport flyers of World War II.

CAB May Raise Nonsked Safety Level

Nonscheduled and contract airlines using transport-type equipment are facing a further tightening of their operating rules to raise the required minimum level of safety still closer to that of the certificated carriers.

CAB announced this month that it has under consideration a revised Part 42 of the Civil Air Regulations "designed to establish such equivalent standards as the inherent differences in scheduled and nonscheduled operations permit." Proposed new requirements would insure comparable aircraft equipment, crew competency, maintenance and operating limitations for regular and irregular passenger carriage.

▶**Some Changes Already Made**—About 400 transport-type multi-engine aircraft similar to those operated by scheduled carriers are now used by nonskeds, according to CAB. It said that while changes already made in Part 42 have introduced some safety requirements for nonskeds highly comparable with those for regular operators, this situation does not hold true in all respects.

The Board proposes raising from 10,000 to 12,500 lb. the weight which will distinguish between rules applicable to "large" aircraft and "small" aircraft. Applicants for an air carrier operating certificate must own or have the exclusive use of at least one standard (NC) certificated aircraft; and no operator will be permitted to use a large aircraft for any type of service unless the plane has been specially inspected by CAA and found to be safe for the service to be offered.

▶**Contract Carriers Affected**—CAB noted that with the expected promulgation of more rigid safety requirements for nonscheduled carriers the tendency to avoid regulation by engaging in (or purporting to engage in) contract activity has increased greatly. The Board said contract operations, especially those involving large aircraft, do not differ materially in their safety aspects from common carrier operations.

But at present non-air carrier activity is governed by Part 43 of the Civil Air Regulations which was designed primarily for the private operator of small aircraft. A proposed new Part 45 makes applicable to contract operators of planes certificated for 12,500 lb. maximum takeoff weight or more the same requirements applicable to common carriers operating similar aircraft on a nonscheduled basis.

Certificated carriers have complained repeatedly that uncertificated operators were not required to observe comparable safety standards. Air Transport Assn. President Emory S. Land charged recently that the uncertificated lines (nonscheduled and contract) have a passenger fatality rate seven to 15 times as high as that of the scheduled operators.

SAL Rebuffed

Standard Air Lines, one of the major transcontinental nonscheduled operators, should have its letter of registration as an irregular carrier revoked for "knowing and willful" violation of the Civil Aeronautics Act, according to CAB Examiner Walter W. Bryan.

SAL not only failed to curtail its services but actually increased them following Board warnings that the operations were violating the nonscheduled exemption, Bryan declared. Besides finding that Standard has flown with excessive frequency and regularity since June, 1947, the examiner said SAL had violated tariff regulations; failed to make proper reports to CAB on alleged contract flights which actually were common carrier services; and failed to report an agreement with other nonskeds to apportion business from military personnel originating at Camp Stoneman, Calif.

Organized in June, 1946, Standard reportedly has made over 1800 transcontinental flights in the past three years. Equipment consists of seven DC-3s. Last August, CAB ordered Standard's letter of registration suspended, but the move was blocked in the Federal courts.

Copter Crash Report

The Los Angeles Airways Sikorsky S-51 helicopter that crashed on takeoff from the roof of the Los Angeles Terminal Annex Post Office Building last Jan. 21 was loaded improperly, a CAB

hearing on the accident has disclosed.

Records showed that 244 lb. of mail were inadvertently loaded into the forward compartment of the craft besides the 603 lb. scheduled for the forward compartment and the 147 lb. placed in the rear compartment. Thus, instead of the scheduled 750 lb., the total load was 994 lb. This was within the permissible gross takeoff weight for the S-51, but too much of the load was forward.

The aircraft moved forward 6 to 8 ft., rose about 6 ft. from the roof, and assumed an abnormal nose-down flight attitude as it approached the edge of the building. As the ship started a steep right turn, one of the rotor blades struck the roof. The helicopter collided with a 3-ft. parapet around the edge of the roof, rolling over and falling 62 ft. to the street below. The pilot was killed.

Tudor IV Move

Great Britain's badly-jinxed Tudor IV aircraft have been removed from scheduled commercial air service and will be modified for use on the Berlin airlift, according to the Minister of Civil Aviation.

The move came after British South American Airways' Tudor IVs were grounded for the second time in less than a year (AVIATION WEEK, Jan. 31). In January, 1948, a BSAA Tudor IV bound from the Azores to Bermuda vanished with 31 persons aboard. Two months ago, another of the four-engine craft operated by BSAA disappeared with 20 persons on a flight from Bermuda to Jamaica. Cause of both accidents remains a mystery.

Removal of the Tudor IVs from scheduled service forced BSAA to curtail its trans-Atlantic operations, and the carrier's regional director in Argentina has gone to London for conferences on the equipment situation.

N. Y. Copter Service

Prehearing conference on seven applications proposing helicopter service in the New York City area has been set by CAB for Mar. 21. Last four companies to enter route bids are Metropolitan Aviation Corp., New York Helicopter Corp., Air Commuting, Inc., and Island Air Ferries, Inc.

Zimmerly Killed

Bert Zimmerly, 41, manager of Zimmerly Air Transport, Clarkston, Wash., and founder and former president of Empire Air Lines, was killed recently when his single-engine Cessna crashed into a hillside near Pullman, Wash. The veteran Pacific Northwest pilot resigned as head of Empire in the fall of 1946, and returned to fixed base operations.

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House to Probe Mail Pay and Rates

The stage is set for an early inquiry into mail payments to air carriers and air mail postal rates by the House Post Office and Civil Service committee.

Its two main objectives: determine whether "subsidy" mail payments to carriers should be separated from "service" or "compensatory" payments; determine whether air mail postal rates should be revised—either upward or downward.

The inquiry will be one aspect of an over-all investigation into the functioning of the Post Office Department, which, to the dissatisfaction of Congress, showed a $308,792,005 deficit in its operations carried on during the 1948 fiscal year.

▶ **Hoover Commission Report**—Meanwhile, the Commission on the Reorganization of the Executive Branch, headed by former President Herbert Hoover, in its report on reorganization of the Post Office, urged that mail payments to carriers be compensatory and that airline subsidies be paid separately.

Observing that air mail rates are now set by the Civil Aeronautics Board "at a level to provide a subsidy to aviation," the Commission declared: "These subsidies may be most desirable. We recommend, however, that the amounts of these subsidies should be paid to the Post Office by open appropriations from tax funds and not imposed upon the Post Office or the mail users in this hidden manner."

"By such a course," the Commission report continued, "the President, Congress, and the public may know what the amounts of the subsidies are."

▶ **Committee Head Agrees**—Chairman Tom Murray (D., Tenn.) of the House Post Office and Civil Service Committee quickly echoed the Hoover report and issued a statement declaring: "Airline subsidies, which require millions of dollars each year, should be subject to regular appropriations procedures and not be charged to mail pay out of Post Office Department funds."

The Post Office and CAB were directed by Murray to make recommendations for implementing the proposal to separate service and subsidy payments. The difficulty, brought to light at hearings last year, is to determine a service mail pay rate.

Former CAB Chairman James M. Landis pointed out at that time that a service rate would vary widely in its charges for different routes.

▶ **Bills Introduced**—Legislation providing for separation of service and subsidy payments was introduced by Rep. John Kennedy (D., Mass.). Under Kennedy's bill, CAB would set compensatory mail

payment rates. The Post Office could appeal to CAB for rate reductions. CAB would also rule on subsidy payments applied for by airlines, and subsidies awarded would be paid from CAB funds.

In other Capitol Hill action, Postmaster General Jesse Donaldson, in effect, recommended against an increase in air mail postal rates. His report to Congress proposing postal rate increases in almost every category, to increase revenues by $253,375,000 annually, made no mention of air mail boosts.

▶ **Air Mail Postage Cut Proposed**—A decrease in the air mail postal rate from 6 cents to 5 cents an ounce was proposed in a bill introduced by Kennedy. However, there is more support in Congress for an increase in the rate than a decrease.

Air mail business would be opened to nonscheduled air carriers by another bill authorized by Kennedy. Under it, the Postmaster General would be authorized to let contracts for large shipments of air mail to nonskeds as well as certificated carriers where a saving in cost would result.

UAL Not Interested In Super DC-3

United Air Lines President W. A. Patterson has declared flatly his company does not believe in the air coach type of operation. He has also disclosed that United is not interested in the newly-developed "Super DC-3."

Speaking in San Francisco following a directors' meeting, the UAL executive expressed doubt that CAB would freeze nonscheduled coach operators out of business completely and suggested that if the irregular lines were given more freedom their increased costs might force them into bankruptcy.

Patterson said UAL personnel had made "shopper" flights with the $99 transcontinental nonskeds and found that only about 5 percent of the passengers would have flown with United. He added, however, that "on behalf of United's stockholders I am authorized to fight destructive competition wherever I find it."

▶ **Blow to Super DC-3**—Patterson's statement on the Super DC-3 was especially significant because his company operates about 78 conventional DC-3s—more than any other U. S. airline. He indicated that if modifications must be made in the DC-3s to keep them in service, United itself would do the work. Looking into the future, Patterson predicted that United and other carriers would be using jet passenger transports within the next seven to ten years.

In Patterson's opinion, the domestic air transport industry hit bottom in November, 1948, "and from an operations standpoint should show nothing but improvement from now on."

His optimistic view was expressed several days before CAB offered to increase UAL's 1948 mail pay by $2,902,000. Prior to the Board's action, United had shown a systemwide net loss of over $4,600,000 for 1948.

SHORTLINES

▶ **Alaska Airlines**—Reports $152,438 net profit for year ended Oct. 31, 1948, against adjusted net loss of $611,230 for previous fiscal year. Board Chairman R. W. Mashall states the carrier was in the black for the three months ended Jan. 31, 1949, compared with a $214,253 loss for the same period of the previous fiscal year.

▶ **American**—Has taken delivery on 73 of carrier's total order of 75 Convair-Liners. . . . Only three of the carrier's DC-3s are still in passenger operations (between Chicago and Windsor, Ont., and between Fort Worth and El Paso), and these will be retired in favor of Convair-Liners starting Apr. 1. AA first took delivery on DC-3s in June, 1936, and was the first carrier to use the plane.

▶ **Braniff**—CAB has offered to extend the carrier's 95 cents a plane mile temporary mail rate to the new service operated beyond Lima, Peru, to La Paz, Bolivia, and Rio de Janeiro, Brazil.

▶ **Continental**—Has asked CAB for a certificate amendment to permit service from Tulsa and Oklahoma City to Dallas-Ft. Worth via Ada and Ardmore, Okla., and Sherman-Denison, Tex. Continental said Central Airlines, a feeder authorized to serve these points in the Board's Texas-Oklahoma decision in November, 1946, is still inactive and probably will not commence operations before its certificate expires in May, 1950.

▶ **Florida Airways**—Has asked CAB to require Southern Airways to merge with Florida. Florida said Southern tentatively agreed to a consolidation last September but broke off negotiations and has refused to renew them. Southern hopes to activate part of its feeder system in May. CAB has stated it will not extend Florida's short-haul certificate beyond Mar. 28.

▶ **Northwest**—CAB has suspended pending investigation a NWA tariff providing systemwide roundtrip excursion fares which would be 150 percent of regular one-way fares. United Air Lines protested against the new tariff, which was to become effective Mar. 3.

▶ **Panagra**—Has cut passenger fares be-

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tween Miami and South American points.

▶ **Scandinavian Airlines System**—Has asked CAB to amend its trans-Atlantic foreign air carrier permit to authorize service to Hamburg, Germany, as a point between terminals in the Scandinavian countries and Prestwick, Scotland.

▶ **Seaboard & Western**—Prehearing conference on the carrier's request for an international all-cargo certificate has been scheduled for Mar. 30. CAB denied S&W's request that its certificate bid be consolidated for hearing with the Pan American Airways-American Overseas Airlines merger case.

▶ **Swissair**—Will resume weekly DC-4 service between New York, Zurich and Geneva around May 1.

▶ **Trans-Pacific**—Plans to inaugurate its newly certificated Hawaiian Island service about June 1 with four DC-3s. Company's personnel will be expanded from about 20 to more than 100.

▶ **United**—Board of directors has extended to Dec. 31, 1951, the option of UAL President W. A. Patterson to purchase 2817 shares of authorized but unissued common stock at $11 a share. Stock rcently has been selling at around $12 a share.

▶ **Wisconsin Central**—President Francis Higgins told a Wisconsin legislative finance committee recently that his company might have to stop operations in two years unless the state comes to the aid of airport development.

CAB SCHEDULE

Mar. 14—Prehearing conference on extension of Empire Air Lines' feeder certificate. (Docket 3649)

Mar. 14—Hearing in reopened Mississippi Valley and Southeastern States area cases. (Docket 548-501 et al.)

Mar. 14—Hearing on Board's enforcement proceeding against Viking Airliners, Aero-Van Express Corp., and Viking Air Transport Co. (Docket 3447)

Mar. 21—Hearing on Florida trunkline service case. (Docket 2215 et al.)

Mar. 21—Prehearing conference on New York area Helicopter service case. (Docket 946 et al.)

Mar. 22—Hearing on TWA's complaint against Pan American Airways' Saudi Arabian service. (Docket 3264)

Mar. 28—Hearing in New England states route case. (Docket 2196 et al.)

Mar. 28—Hearing on Board's enforcement action against Nats Air Transportation Service. (Docket 3456)

Mar. 30—Prehearing conference on Seaboard & Western Airlines' request for international all-cargo certificate. (Docket 3041)

Apr. 11—Hearing in reopened Hawaiian case. (Docket 851 et al.)

Apr. 11—Hearing on Board's investigation of through service and interchange requirements at St. Louis and Memphis. (Docket 3426)

May 2—Hearing on additional southern transcontinental service. (Docket 1102 et al.)

May 16—Hearing on Hughes Tool Co. control of TWA. (Docket 2796)

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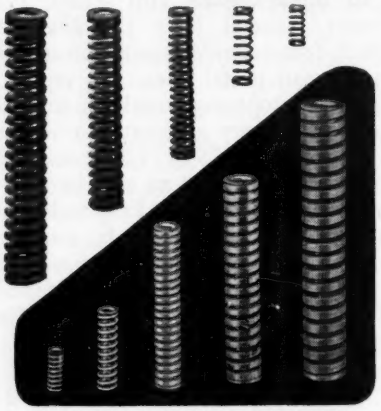

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LETTERS

Manpower Shortage?

In a recent issue of AVIATION WEEK is an item which would be funny if it wasn't for the seriousness of today's international situation. I refer to the item on the labor shortage.

Some time during the period of 1942 to 1944, while employed by Brewster, I filled out a questionnaire which was a survey of ALL scientific and engineering personnel, made by a government committee.

If the aircraft industry is short of draftsmen, as your item claims, why doesn't the industry check up on the men listed in that survey? Or can it be that the executives of the industry do not know of the existence of this survey?

Also, why doesn't the industry check its roll of ex-employes and contact them? I know men who wanted to stay in the industry but who were dropped, and they were competent men too. . . .

There are plenty of men who would go back to aircraft concerns if they were offered the chance. I know of two Long Island plants that throw away applications after six months, yet they will probably protest that they can't get men. Do these companies expect men to stay out of work for months till some personnel man makes up his mind? Or do they expect men, disgusted with waiting and having taken other jobs, to lose time and pay running around to plants at the pleasure of some personnel men?

These are the things that drive men away from the aircraft industry. If the industry needs men, let them check up on the methods of their personnel men and let them review their former employees.

I trust you will print this letter as a guide to the industry.

WILLIAM H. MOESEL
258 Franklin Ave.
Brooklyn 5, N. Y.

Cargo Craft

Thanks for all of us at Chase for the splendid story in the Jan. 3 issue. Until now we have been relatively unknown, but optimistically believe that we are over the hump and have made a place for ourselves in development and manufacture of some excellent aircraft.

On the subject of cargo and freight airplanes, to which we have devoted our development history, I wish to comment on your AVIATION WEEK Page on "Prototype Cost," also in Jan. 3 issue. We have followed with keen interest, the Interdepartmental Committee prototype cargo aircraft development program.

We are well advanced in preliminary design for aircraft in each of the three categories discussed. We propose, for the fifteen ton capacity cargo transport, a modification of our C-123 which is scheduled to fly before this coming summer. This aircraft would be powered with twin R-4360 engines and would be similar in external appearance to the others in the line of Chase transports described in your story, referenced above. This airplane would meet the performance requirements for the long-haul transports and could be manufactured for delivery very considerably below the price tag on the Lockheed's Constellation. Its economy in operation, particularly for air freight work can be well appreciated by anyone who has studied our C-122 and C-123 Avitruc designs.

For the Mason Committee's short-haul 5-ton capacity cargo transport we propose the C-122C, which we anticipate will be in production in the coming year. This plane will be completely similar in exterior appearance to the C-122 which you have described. However, this model will have a longer fuselage, 100 square feet more wing area, and be powered by twin-installation R-2180 engines. The delivery price of this aircraft will be very considerably below that of the aircraft in this category mentioned in your research article.

Our design proposal for the 2½-ton capacity feederliner is a redesign of our CG-14A glider and would be powered by twin-installation R-1340 engines. The aerodynamic performance of this craft and its operational economy would meet the Committee's requirements and feeder characteristics remarkably well.

W. F. SAUERS, Executive Engineer
Chase Aircraft Co., Inc.
West Trenton, N. J.

Poor Instrument Pilots

I am a subscriber to your magazine and I have seen the effect your editorials have in bringing about improvements in the aviation industry. . . .

Why are pilots who hold instrument ratings, but who are not air carrier personnel, not required to pass periodic checks to demonstrate proficiency, knowledge of changing procedures, etc.

As the regulations now stand, once a pilot has an instrument rating, all that is necessary to keep it valid is that he fly six hours of instruments every six months. I feel that is not necessarily a ssatisfactory means of maintaining the proficiency that is necessary for instrument flying today.

If each pilot was required to pass a periodic check with a CAA inspector, or someone designated by the CAA, he would be sure that the pilot was proficient in instrument flying, that he was aware of changes in regulations, that he was familiar with latest changes in procedures, and that he had accomplished the minimum number of instrument hours in the previous period.

Many traffic delays, to say nothing of accidents, and near accidents, are caused by instrument pilots who don't know the score. This could be prevented. Why isn't it?

I. H. MONTGOMERY, Operations Manager
Aviation Training Enterprises
6220 So. Archer Ave., Chicago 38, Ill.

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THE SEARCHLIGHT SECTION

a **market prediction** of importance to operators requiring the Pratt & Whitney R-1830-92...

The prediction is for the prices of surplus zero time R-1830 model engines to continue their present upward trend until they level off slightly below the cost of commercial overhaul. Several factors are making this ascending market inevitable. The first is an increasing amount of expensive re-work caused by advancing corrosion in most eighteen-thirty surplus engines, the second is the increasing scarcity of surplus engines on the open market, and the third is the accumulation of very substantial blocks of the remaining engines by groups who are well aware of the present market tendency, and who, in many cases have been waiting for this time with the intention of "cashing in" on their holdings. The prices of most suppliers have already spiraled up from the seventeen-hundred dollar level to $2,000, and in some cases prices have gone as high as $2500. As these prices continue to climb they are releasing the competitive pressure which low-cost surplus engines have exerted to keep commercial overhaul prices low, and these in turn may climb. ***If this occurs the whole engine market*** will not stabilize until operators demonstrate what they can, and what they cannot pay for R-1830-92 engines.

If international tensions and the still present undercurrent fear of war perceptibly weaken it may be expected that a substantial number of zero-time engines will be released by the U. S. Armed Forces, in which case it may prove possible for this company to continue supplying its customers with converted R-1830-92 engines at its present price. ***But currently the fact is that the supply*** of 1830 model engines which can be economically converted and passed on to customers at reasonable prices is rapidly becoming undependable. Because of this, Steward-Davis is convinced that the only way to guarantee the DC-3 and C-47 operators of the world a fine engine at a fair price is to supply an engine not subject to the inflationary surplus market.

To do this, Steward-Davis is now completing the enlargement of its shops and the final planning of a production overhaul program based on its more than two years specialization on Pratt & Whitney R-1830-92 engines. These shops and this program will be geared to deliver a production model R-1830-92 Commercial overhaul at the lowest price consistent with the fact that safety and dependability are the pre-eminent criteria for any aircraft engine regardless of price.

The price of the Steward-Davis R-1830-92 production overhaul will be ***$2295 plus your run-out engine,*** and it will be warranted for 600 hours. Orders will be accepted for delivery beginning May 1st. One year contracts are available at discount rates to Operators wishing to plan future operations on this fine engine.

*★This company is still producing the Steward-Davis R-1830-92 Conversion at **$1795** exchange and will continue to supply this warranted conversion to its customers whenever possible; but only when, as now, it can safely offer its customers an R-1830-92 Conversion at a very substantial savings in comparison with the cost of newly major overhauled R-1830-92 engines.*

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STRICTLY PERSONAL

ANOTHER AIR FORCE MERCY MISSION—A few hours after sunny Southern California was buried under its first six-inch snow storm in history, **Leonard David Callahan,** Gilfillan's enterprising public relations chief, received a bulky package from Washington, air mail special delivery. It was from **Maj. Gen. H. M. McClelland.** Inside was the famous manual, "Survival In the Arctic." The General attached a cryptic note: "Hope this reaches you in time."

Callahan waved the book impressively that evening as he presided at the local chamber of commerce meeting.

* * *

ERRATA DEPARTMENT—Typographical and human errors raise ned with more folks in this industry than the AVIATION WEEK staff, it appears. One of our engineering editors was pop-eyed as he watched a short sequence in Curtiss-Wright's promotional movie the other day. As commentator **Lowell Thomas** regaled us with the war record of the Curtiss Helldiver the screen doggedly wound through a shot of a Douglas Dauntless formation rolling over into a dive. Fortunately, the old Wright Cyclones were showing up on the Dauntless. . . . And Washington's NBC television station was swamped with indignant phone calls the other night after a caption labelled the Air Force's big Andrews Field Presidential prevue with "Army Shows Its Air Arm" the same day Curtiss-Wright began distributing booklets to the public describing the virtues of the T-28 trainer to be used by the "Army Air Forces."

* * *

BITS ABOUT PEOPLE—**Dick Boutelle's** compendium of ribald ballads is off the press after a long delay due to a copyright red tape. **Warren Smith,** Fairchild's Hagerstown PRO, did the editing. Some National Press Club specialists who saw an advance copy insist it's a collector's item. . . . **Dale Armstrong,** ex-PRO of Northrop and TWA, has gone to England as European public relations director of Foote, Cone & Belding International (advertising) . . . **Thomas J. Deegan, Jr.,** ex-publicity chief of American Airlines, has been elected vice president-public relations of Chesapeake & Ohio RR. He is also president of the Robert R. Young-inspired Federation of Railway Progress. . . . The N. Y. World-Telegram business page says, "There's no easy way to find out how much soul-searching it took but, anyway, the library of Eastern Air Lines announces several new tomes on its shelves, including a copy of 'This Fascinating Railroad Business'." . . . **C. Bedell Monro,** former president of PCA, is president of United Service Associates, Inc., Washington, firm specializing in company representation, industrial engineering and public relations. . . . **Ronny Gall,** ill since late 1947, is back on his feet and meeting old friends in New York again. He was formerly with Curtiss-Wright and National Airlines. . . . **Lee H. Smith** has resigned as sales manager of Beech Aircraft Corp., to take a three or four months vacation, but mail addressed to him at Beech will be forwarded.

* * *

ALMOST A HAIR SHIRT FOR WILSON—**Gill Robb Wilson,** the Herald Tribune's well known evangelist of aviation, appeared at the Air Force's demonstration at Andrews Field and dwelt heavily, for all who would listen, on the virtues of his white nylon shirt he had been wearing for six days, with the benefit of a nightly washing. According to **Bob Boylan, Max Cook** of Scripps-Howard remarked casually that it was lucky Gill hadn's been wearing it at Jacksonville when the ammonia fumes disintegrated all nylon in the neighborhood. A few minutes later the XB-47 roared off in a JATO fog that was rolling toward the crowd. "Ammonia," screamed one of Gill's pleasant companions. Gill went into a tizzy trying to wrap up in his topcoat to prevent a strip tease.

* * *

MAKING UP FOR THE NO-SHOW—**Jan Guthrie,** who engages in press agentry for American Airlines at Los Angeles, tells our **Scholer Bangs** this one:

"A shipper sent his dog to the L.A. Airport in a crate marked, RUSH! THIS DOG EXPECTING. But before the plane time the inevitable happened and the loaders saw this laconic postscript penciled under the original warning: TOO LATE.

* * *

LET CAB RULE ON THIS ONE—**Bill Key** of AIA reports that Monarch Airlines Executive Vice President **Ray Wilson** ran into a policy matter which may be sent to Washington for a ruling by CAB. They transported a young steer for a Colorado rancher from Grand Junction to Denver and the airline executives couldn't decide whether to charge calf fare or bull fare.

R. H. W.

WHAT'S NEW

New Books

"The Air Officer's Guide," edited by Military Service Publishing Co. A new edition of the standard Army Officers Guide, especially for Air Force officers. Published by the Military Service Publishing Co., 100 Telegraph Bldg., Harrisburg, Pa. Price $3.50.

"Aircraft Dispatcher Rating," by Charles A. Zweng, including multiple choice questions and answers for the aircraft dispatcher rating. Lithographed, published by Pan American Navigation Service, 12021 Ventura Blvd., No. Hollywood, Calif.

"The Welding Encyclopedia," by T. B. Jefferson, the complete story of welding, including 1398 charts, illustrations and figures, 274 tables, 90 pages of trade names, and 16 data sheets. 12th edition, 1000 pages. Published by The Welding Engineer Magazine, 330 West 42 St., New York 18, N. Y. Price $6.50.

Yearbook Data

Readers using the Feb. 28 "Inventory of U. S. Air Power" of AVIATION WEEK as a permanent reference are requested to make the following changes:

PAGE 14, first column, line 16—Designation of the Republic plane should be F-84.

PAGE 15, photo at upper left—Caption should read, McDonnell F2H-1 Banshee.

PAGE 16—Latest information is that current order for Boeing XB-47 is ten, and for Chance Vought XF7U-1, 19.

PAGE 20, table on "U. S. Aircraft Industry"—Employment at East Hartford plant of Pratt & Whitney Aircraft division of United Aircraft Corp. is 15,140, making total employment of plants listed 199,458.

PAGE 40, two center photos—Plane on left is Douglas D-558-II, plane on right is Douglas D-558-I.

PAGE 126, photo at upper left—Caption should read, Fokker Promoter (Netherlands).

PAGE 130, table at top of page—December unit figure should be 209, making total 7039. Value remains unchanged.

PAGE 130, first line of note under engine table—Should read Jan.-May horsepower for military only.

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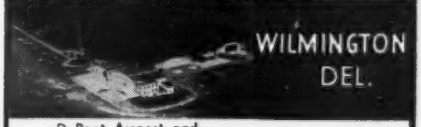

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EDITORIAL

The Air Force Secretary

With the appointment of a new Secretary of National Defense, the No. 1 question in the aircraft industry is: Will Secretary Symington remain?

There are those in Washington, "in high circles," who will tell you yes, and as many more say no. But we hope Stuart Symington is permitted to carry on with his job as our first Secretary of the Air Force. So far, on the evidence we have seen, he has turned in a remarkable performance of organization and building an Air Force on the lines made possible by the separate Air Force legislation. And his relations with the public and Congress have been outstanding. He is highly thought of on Capitol Hill.

Mr. Walter Lippmann, the eminent columnist, put it very well last week when he wrote that Mr. Symington, during the period when he continued to urge a 70-Group Air Force last year, against Forrestal's declared policy, "was clear, forceful, and untroubled by doubt."

Aviation needs men who are clear, forceful, and untroubled by doubt, and so far we, like Mr. Lippmann, think Mr. Symington is one of these men.

Better Lightplane Merchandising

The light airplane industry doesn't know much about John Lawler yet, but they will be hearing more about him.

Aeronca Aircraft Corp.'s president came from Curtiss-Wright, where he was controller for the Airplane division. He has a rather hard-boiled attitude toward profit and loss.

Lawler is realistically optimistic about the future of the lightplane business. He is already producing excellent aircraft and he intends to improve them steadily with the development of the art.

But he is not so imbued with the romance of aviation that he will risk the life of his company by turning down non-aircraft manufacturing business. Actually, he has been his company's star salesman. He has already shown the Air Force that Aeronca can manufacture such needed items as ground maintenance stands for four-engined aircraft, and high priority combat equipment like rocket launching devices for bazookas. Already, in Mr. Lawler's short span as president, Aeronca has completed, or has on the books, military contracts totaling $1.5 million and at least as much more is expected this year.

Primarily because of the success of Aeronca's non-aircraft contract history, and its prospects for more, the Reconstruction Finance Corp. is seriously considering the company's loan application.

Lawler admitted to us last week, as we visited with him and other company executives at Middletown, Ohio, that he has heard criticism from some other aircraft industry executives because he has launched an aggressive non-aircraft manufacturing program.

Lawler believes his first obligation is to his stockholders. That means keeping his company and its personnel intact. If he can do that, even strengthening the company in the process, he feels he is maintaining this pioneer lightplane firm in a healthy condition until the private aviation business improves. This in itself is a service to the lightplane industry.

Some of his ideas on the airplane business are provocative.

Yearly models are out. He will make steady improvements as production continues but he feels that in the present state of personal aircraft sales, "new" models are usually not new models at all, and their advertising as such cuts sales of current models as much as it improves sales of new ones.

Like several other plane makers, Lawler will refuse to build any plane that is not sold before it starts down the assembly line.

Lawler believes there is something radically wrong in this lightplane merchandising and selling business. He estimates currently that Aeronca has about 33 distributors and 1400 dealers. In 1948 Aeronca delivered a grand total of 599 planes. That is about a third of a plane per dealer per year. Piper Aircraft Corp. has about 1500 dealers, and sold a total of 1479 planes last year.

What kind of a dealer is it who cannot average one plane a year, Mr. Lawler asks? Why is an aircraft manufacturer justified in running up any kind of expenses on such a dealer?

Furthermore, the dealer record is even blacker than indicated above because many of those 1948 "sales" were not sales to the public at all. The dealers bought hundreds of those ships for their own fixed base use.

So Lawler is about to put Aeronca's distributor system through the wringer to shrink it down to a size comparable to today's sales. He expects the distributors to wring the water out of their dealer systems. The result should be a smaller, more efficient sales organization. Each distributor or dealer will have a large enough territory to give impetus to real selling.

Lawler realizes that part of the problem is a duplication of dealers. Many operators have several dealerships, in lines which are at least partially competitive. But competition in their areas is weak, little sales effort is expended, because no matter which lightplane that occasional customer buys, the dealer will be cut in. Aeronca hopes to raise the temperature of the typical aircraft dealer a little.

"The world owes me a living" has been heard for so long in personal aviation that Aeronca's audacious thinking and energetic drive for new business is a refreshing contrast.

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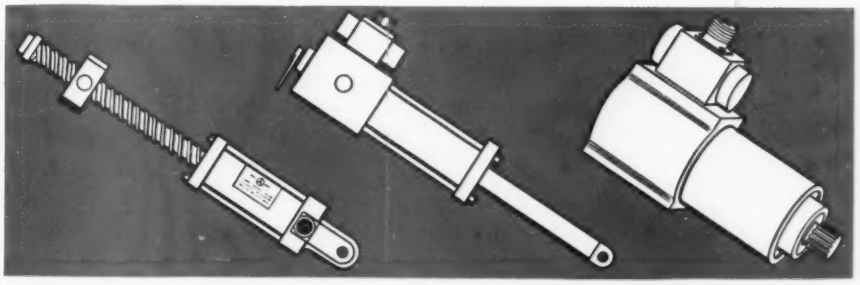

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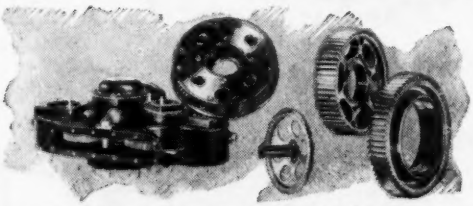

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